Oracle® MICROS Hardware
Site Preparation Guide

June 2015

ORACLE

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Preface

This manual describes the preparation of the site prior to the installation of the Oracle MICROS Point of Sale equipment. This ranges from installing the required AC power and grounding system to installing and terminating various data communications cables. After the AC Power system and data communications cables have been installed, we recommend thorough inspection of the site to ensure the work is adequate.

NOTE: This document has been rebranded as part of the Oracle MICROS acquisition activities. References to former MICROS product names and agreements may exist throughout this document.

Audience

This manual concentrates on the site preparation requirements of the Oracle MICROS Point of Sale Hardware and is not related to a particular application.

The information in Chapters 3 and 4 is provided for personnel who fully understand the procedures and standards for installing AC power and grounding systems, as well as installing, terminating, and certifying Ethernet cables.

Customer Support

To contact Oracle Customer Support, access My Oracle Support at the following URL:

https://support.oracle.com

When contacting Customer Support, please provide the following:

- Product version and program/module name
- Functional and technical description of the problem (include business impact)
- Detailed step-by-step instructions to re-create
- Exact error message received
- Screen shots of each step you take

Documentation

Oracle Hospitality product documentation is available on the Oracle Help Center at http://docs.oracle.com

Revision History

Date	Description of Change
June 9, 2015	• Rebranded MICROS Hardware Site Prep Guide to Oracle.

1 Introduction to the Oracle MICROS Hardware

This chapter introduces the Oracle MICROS POS hardware, printers, and the network connections required to tie it all together.

Introduction

This manual concentrates on the site preparation requirements of the Oracle MICROS Point of Sale Hardware and is not related to a particular application. From a site preparation standpoint, a typical system is composed of the following components:

- Server(s)
- Workstations - includes mTablet and mStation
- Peripherals such as Scales, Coin Changers, and Bar Code Readers.
- Printing Devices using RS232, IDN, and Ethernet interfaces.
- Kitchen Display Systems (KDS)
- e7 Kitchen Video Monitor (KVM) Controller
- Order Confirmation System (OCS)
- e7 Back Office Controller or Digital Menu Board Controller
- NetCC2 (9700)

Topics reviewed in this chapter include the individual hardware devices that comprise a system and how they are connected together to form systems.

Servers

Oracle Hospitality software applications operate in a client/server environment where the database resides on one PC (the server) and accessed by one or more desktop workstations and/or mobile devices (clients) over an Ethernet based LAN or Wi-Fi.

One exception is the e7 application which can operate in a peer to peer mode or connect to a Back Office Controller (BOC) server for support, credit authorization, and reporting purposes.

Workstations

This section provides a brief description of the current MICROS Workstations and highlights the site preparation requirements.

mTablet

The MICROS mTablet is a 10" (1024x600) Wi-Fi based tablet with a standard TFT LCD and available daylight viewable LCD. mTablet is also available in a concessions version that must permanently reside on the mStation, introduced next.

Figure 1 – MICROS mTablet

Features

Table 1 – mTablet Features

Feature	Specifications
Display	10.1" WVGA (1024x600) TFT LCD /w LED Backlights Portrait or Landscape orientation, Auto Rotating.
Case Material	Magnesium Alloy, PC-ABD and Nylon materials. Spill and drop resistant.
Weight	830 grams (1.8 lbs.)
Physical Dimensions	16mm D, 176mm W, 292mm H (0.62" x 6.90" x 11.5")
Mag Stripe Reader	Modular Integrated 3-Track card reader capable of encryption at the swipe.
Ports	• Charging Pins (for mTablet Multi-Bay Charger) • Multi-function connector for mStation (All signals between mTablet and mStation). • USB OTG (For Charging Kit PN 700531-031)
Network	802.11 a/b/g/n Wi-Fi with WPA WPA2, TKIP, AES support. Bluetooth V2.01 *** Wi-Fi/Bluetooth not available on Concessions mTablet**
Battery	Embedded Lithium Ion (21.8Wh) ***Embedded Battery not available on Concessions mTablet**
Input Power	5 VDC, 2.5A
BTU/Hour	120 Typical, 290 Maximum
Operating Temperature	-10°C (14°F) to 60°C (140°F) When Charging Battery: 0°C (32°F) to 45°C (113°F)

Storage Temperature	-25°C (-13°F) to 85°C (185°F)
Setup Guide PN	100016-179
Certifications	FCC Class A, UL, CE, TUV, RoHS, China RoHS
Application Support	https://portals.micros.com/hardware/SitePages/Home.aspx
HSG Portal Page	https://portals.micros.com/hardware/HSG/pages/mTablet%20mStation.aspx

Connectors

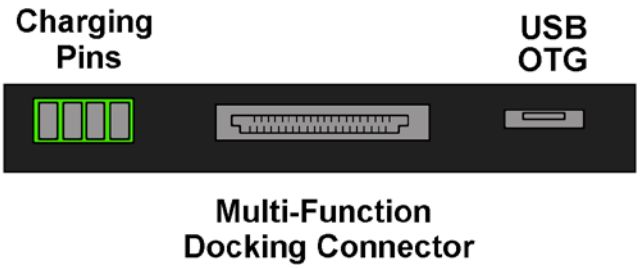


Figure 2 – mTablet Connectors

- The Charging Pins shown on the left are used by the optional mTablet Multi-Bay Charger.
- The Multi-Function Docking Connector plugs into mStation carries all signals between mTablet and mStation.
- The USB OTG Port is used for Charging mTablet, or firmware updates and maintenance.

mStation

When the Mobile or Concessions mTablet is plugged into the mStation shown below, it provides the ports required to drive peripherals such as cash drawers, printers, barcode scanner, customer displays, coin changer and connectivity to wired Ethernet.

Figure 3 – mStation (with mTablet)

Features

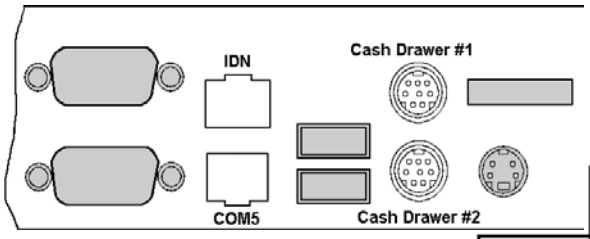
Table 2 – mStation Features

Feature	Specifications
Display	mTablet
Case Style	Supports mTablet in Left-or-Right Landscape or Portrait mode
Weight	/w mTablet: 2.60 kg (5.75 lb.) /w mTablet and Optional Smart Battery: 3.08 kg (6.80 lb.)
Physical Dimensions	See Appendix A
Optional Customer Display (Series 2)	Integrated or Pole 240x64 STN Graphics LCD Integrated 2x20 LCD Protege Pole Customer Display System
Serial Ports	2 DB9 Powered RS232 /w handshake • COM1 (5V/9V/12V User Selectable) • COM2 (12V) • 1 Modular RS232 Serial /w handshake (COM5) • 1 Modular IDN Serial (RS232 or RS422) • 1 Customer Display Port
USB Ports	• 4 USB 2.0 • 1 MICROS Powered USB (12V) - Intended for Protege
Network	10/100/1000 Mbps Ethernet - RJ45
Battery	Optional 79Wh Lithium Ion Smart Battery

Input Power	25 Watts
AC Input Voltage	Universal Input - 85 to 264VAC, 47 to 63Hz.
BTU/Hour	120 Typical, 290 Maximum
Operating Temperature	-10°C (14°F) to 60°C (140°F) When Charging Optional Smart Battery: 0°C (32°F) to 45°C (113°F)
Storage Temperature	-25°C (-13°F) to 85°C (185°F)
Setup Guide PN	100016-179
Certifications	FCC Class A, UL, CE, TUV, RoHS, China RoHS
Application Support	https://portals.micros.com/hardware/SitePages/Home.aspx
HSG Portal Page	https://portals.micros.com/hardware/HSG/pages/mTablet%20mStation.aspx

Connectors

The Figure below points out the mStation Modular COM ports and 8-Pin Mini-DIN Cash Drawer connectors. The table shows the applicable IDN Patch Cables, RS232 Dongles and Cash Drawer Conversion Cable(s).



	IDN Cable	RS232 Dongle
IDN	300319-036 (3ft) 300319-120 (10ft)	300319-102
COM 2	N/A	300319-103
CD #1 CD #2	Cash Drawer Conversion Cable, Series 1-Series 2 PN 300290-020	

Figure 4 – mStation Modular and Smart Cash Drawer Connectors

mStation introduces a new cash drawer connector to support the APG Smart Cash Drawer. Cash Drawer Conversion Cable, PN 300290-020 adapts a MICROS Cash Drawer with 4-pin DIN connector to mStation.

mTablet Multi-Bay Charger

The Multi-Bay Charger is a dedicated charging station for mTablet. It can be placed on a wall with installer supplied hardware or a counter surface with the provided brackets. The Multi-Bay Charger is supplied in kit form with four Charging Trays, the assembled version is shown in the Figure below.

Figure 5 – mTablet Multi-Station Charger /w Four Charging Trays

Additional trays can be purchased for a maximum of eight Charging Trays. Each Charging Tray includes a pair of LED indicators to monitor mTablet charging.

Table 3 – mTablet Multi-Station Charger Features

Feature	Specifications
Charging Indicator	A pair of LEDs in each Charging Tray display the charge status
Case Style	Consists of a wall or counter mounted Charging Rail that supports up to eight Charging Trays, each charging a single mTablet. Charging Trays can be left facing or right facing.
Weight	> Shipping Weight = 4.5 kg (10 lbs.) > With 4 mTablets = 11.3 kg (25 lbs.) > With 8 mTablets = 15.9 kg (35 lbs.)
Physical Dimensions	See Appendix A
Input Power	40W Typical, 130W max /w 8 mTablets
AC Input Voltage	Universal Input - 85 to 264VAC, 47 to 63Hz.
Operating Temperature (Charging)	0°C (32°F) to 45°C (113°F)
Storage Temperature	-25°C (-13°F) to 85°C (185°F)
Installation Documentation	Supplied with mTablet Multi-Bay Charging Kit
Certifications	FCC Class A, UL, CE, TUV, RoHS, China RoHS

PC Workstation 2015

The latest member of the MICROS PCWS family, the 2015 resembles the Workstation 5A but adds support for one or two SATA disk drives along with two processors selected from the Intel Calpella Platform.

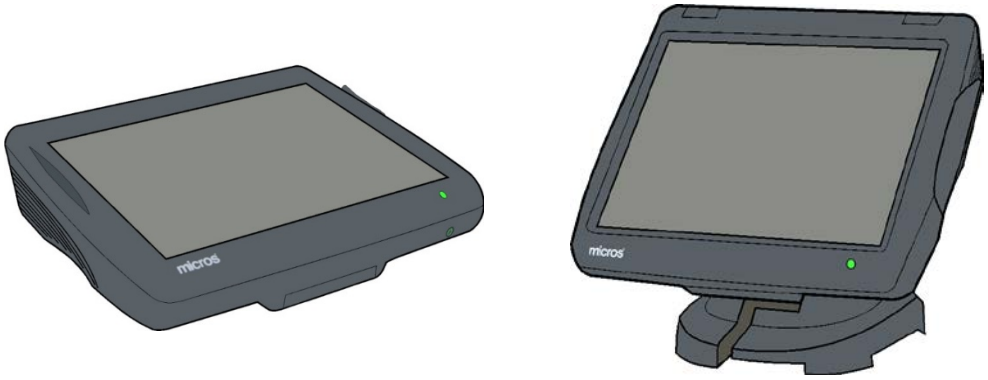


Figure 6 – PC Workstation 2015

Features

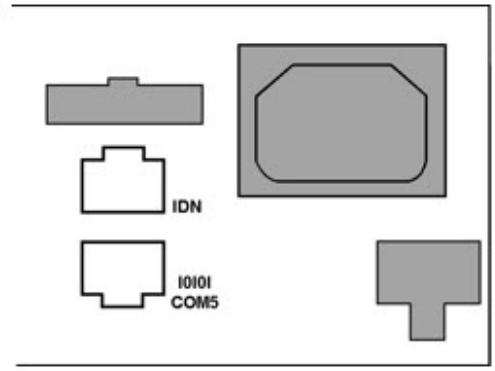
Table 4 – PC Workstation 2015 Features

Feature	Specifications
Display	Standard 1024x768 15″ TFT Color LCD
Case Style	Standard Low Profile or Optional Adjustable Stand
Case Material	PC-ABS Plastic
Weight	13.2 lbs. (6.0 kg), Shipping Weight 17.6 lbs. (7.9 kg)
Physical Dimensions	See Appendix A
Optional Customer Displays (Series 1)	Integrated or Pole 240x64 STN Graphics LCD Integrated or Pole Protege Customer Display System
Cash Drawers	2 MICROS 4-Pin DIN Connectors - +12V or +24V selectable in BIOS.
COM Ports	• 1 DB9 RS232 Serial (COM1 - Powered (5V, 9V, or 12V - Selectable in BIOS) • 1 DB9 RS232 Serial (COM2 - Non Powered) • 1 Modular RS232 (COM5) • 1 Combination RS232/RS422 (COM4)
USB Ports	Four USB 2.0 Ports (All External USB Ports can be disabled through the BIOS or Diagnostics Utility)
Powered USB Ports	Two MICROS Powered USB Ports USB5 (+5V, +12V, +24V) - USB6 (+5V, +12V)
LAN Interface	10/100/1000 Mbps Ethernet - RJ45
AC Input Voltage	Universal Input - 85 to 264VAC, 47 to 63Hz.
Input Power	35W Typical

BTU/Hour	120 Typical, 290 Maximum
Operating Temperature	0°C (32°F) to 45°C (113°F), 90% relative humidity max.
Storage Temperature	-25°C (-13°F) to 80°C (176°F)
Setup Guide PN	100016-178
Application Support	https://portals.micros.com/hardware/SitePages/Home.aspx
HSG Portal Page	https://portals.micros.com/hardware/HSG/pages/PCWS%202015.aspx

Connectors

The Figure below points out the PCWS 2015 Modular COM ports, and lists the applicable IDN Patch Cables and RS232 Dongles.



	IDN Cable	RS232 Dongle
IDN	300319-036 (3ft) 300319-120 (10ft)	300319-102
COM 5	N/A	300319-103

Figure 7 – PCWS 2015 IO Panel Modular Connectors

AC Power Requirements

Preferred AC Power System - Chapter 3

LAN Requirements

Category 6 or better Face Plate and Patch Cable - Chapter 4

Workstation 5A

The Workstation 5A is a fan-less Windows Embedded CE 6.0 client, also capable of running POSReady 2009. Based on the same casework as the WS5, it uses a new System Board with an Intel Atom N450 Processor for improved performance. The Operator LED is White to distinguish the 5A from the original Workstation 5 Blue.

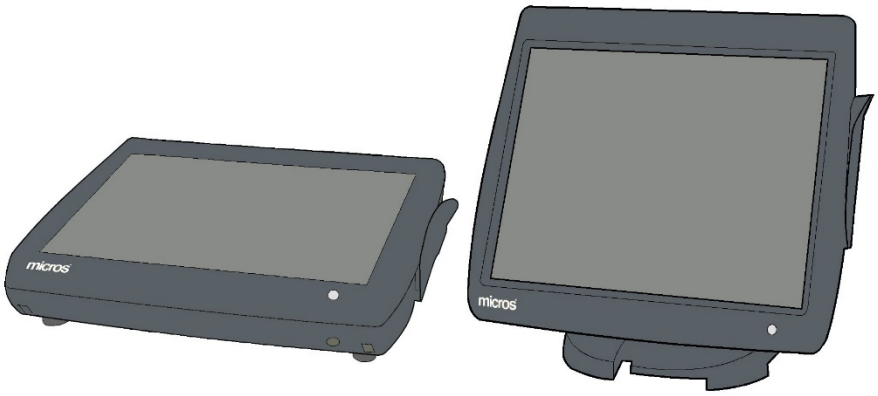


Figure 8 – Workstation 5A

Features

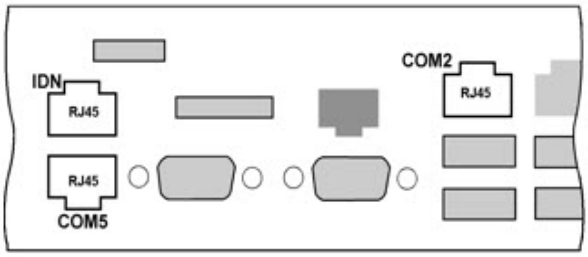
Table 5 – PC Workstation 2015 Features

Feature	Specifications
Display	Standard 1024x768 15″ TFT Color LCD
Case Style	Standard Low Profile or Optional Adjustable Stand
Case Material	PC-ABS Plastic
Weight	10.5 lbs. (4.7 kg) / Shipping Weight 14.0 lbs. (6.35 kg)
Physical Dimensions	See Appendix A
Optional Customer Displays (Series 1)	Integrated or Pole 240x64 STN Graphics Capable LCD Integrated or Pole Protege Customer Display System
Cash Drawers	2 MICROS 4-Pin DIN Connectors - +12V or +24V selectable in BIOS
COM Ports	• 1 DB9 RS232 (COM1 - Non Powered) • 1Combination RS232/RS422 (COM4) • 2 Modular RS232 (COM2, COM5)
USB Ports	Four IO Panel USB 2.0 Ports (can be disabled)
Powered USB Ports	One MICROS Powered USB Port (+5V, +12V, +24V) (All External USB Ports can be disabled).
LAN Interface	On Board 10/100/1000 Mbps Ethernet - RJ45
AC Input Voltage	Universal Input - 85 to 264VAC, 47 to 63Hz.
Input Power	24W Typical
BTU/Hour	83 Typical

Operating Temperature	0°C (32°F) to 45°C (113°F), 90% relative humidity max.
Storage Temperature	-25°C (-13°F) to 80°C (176°F)
Setup Guide PN	100016-175
Application Support	https://portals.micros.com/hardware/SitePages/Home.aspx
HSG Portal Page	https://portals.micros.com/hardware/HSG/pages/Workstation%205A.aspx

Connectors

The Figure below points out the WS5A Modular COM ports, and lists the applicable IDN Patch Cables and RS232 Dongles



	IDN Cable	RS232 Dongle
IDN	300319-036 (3ft) 300319-120 (10ft)	300319-102
COM 2	N/A	300319-103
COM 5	N/A	300319-103

Figure 9 – Workstation 5A IO Panel Modular Connectors

AC Power Requirements

Preferred AC Power System - Chapter 3

LAN Requirements

Category 6 or better Face Plate and Patch Cable - Chapter 4

Workstation 4 LX

The Workstation 4 LX is a low-cost diskless/fan-less embedded terminal based on Windows CE .NET and supported by all Oracle MICROS application software. Shown below is the standard Low Profile (Left) and the WS4 LX installed on the optional adjustable stand. (Right).

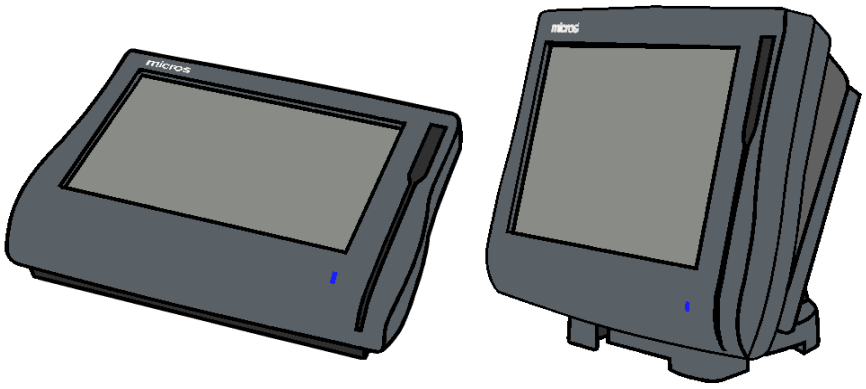


Figure 10 – Workstation 4 LX

Features

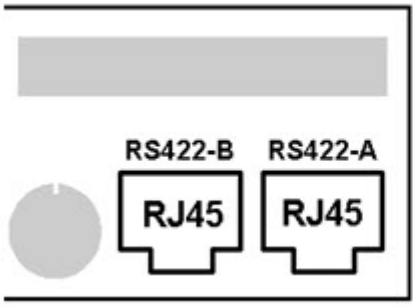
Table 6 – Workstation 4 LX Features

Feature	Specifications
Display	Standard 800 x 600 12.1″TFT color LCD touchscreen
Case Style	Standard Low Profile or Optional Adjustable Stand
Case Material	PC-ABS Plastic
Weight	7.7 lbs. (3.5 kg) / Shipping Weight 11 lbs. (5 kg)
Physical Dimensions	See Appendix A
Optional Customer Displays (Series 1)	Integrated or Pole 240x64 STN Graphics Capable LCD Integrated or Pole Protege Customer Display System
Cash Drawers	2 MICROS 4-Pin DIN Connectors - +12V or +24V selectable in the BIOS.
COM Ports	• 1 DB9 RS232 • 1 Modular RS232 • 2 Combination RS232/RS422
USB Ports	4
LAN Interface	On Board Mbps 10/100/1000 - RJ45
Input Voltage	Universal Input - 85 to 264VAC, 47 to 63Hz.
Input Power	23W Typical, 65W Max
BTU/Hour	80 Typical, 222 Maximum
Operating Temperature	0°C (32°F) to 45°C (113°F), 90% relative humidity max.

Storage Temperature	-24°C (-13°F) to 80°C (176°F)
Setup Guide PN	100016-162
Application Support	https://portals.micros.com/hardware/SitePages/Home.aspx
HSG Portal Page	https://portals.micros.com/hardware/HSG/pages/Workstation%204%20LX.aspx

Connectors

The Figure below points out the WS4 LX Modular COM ports, and lists the applicable IDN Patch Cables and RS232 Dongles.



	IDN Cable	RS232 Dongle
RS422-A	300319-036 (3ft)	300319-102
	300319-120 (10ft)	
RS422-B	300319-036 (3ft)	300319-102
	300319-120 (10ft)	

Figure 11 – Workstation 4 LX IO Panel Modular Connectors

AC Power Requirements

Preferred AC Power System - Chapter 3

LAN Requirements

Category 6 or better Face Plate and Patch Cable - Chapter 4

KW270

The MICROS KW270 is a low-power diskless Windows CE based workstation based on a Freescale Semiconductor ARM processor.

Designed for high volume applications in indoor and outdoor environments, it features a rugged membrane keyboard and supports a wide range of operating temperatures.

Figure 12 – KW270

Features

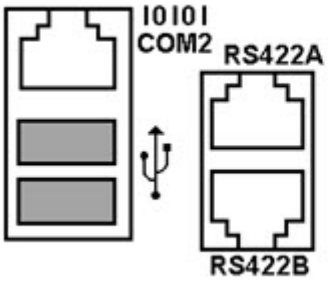
Table 7 – KW270 Features

Feature	Specifications
Display	5.7″ 320x240 Operator LCD
Case Style	Standard Low Profile or Optional Adjustable Stand
Case Material	PC-ABS Plastic
Weight	7.7 lbs. (3.5 kg) / Shipping Weight 11 lbs. (5 kg)
Physical Dimensions	See Appendix A
Customer Display	Integrated 2x20, LCD
Optional Customer Displays	Pole 240x64 Graphics Capable LCD
Cash Drawers	2 MICROS 4-Pin DIN Connectors - +12V or +24V jumper selectable.
Serial IO Ports	• 1 DB9 RS232 (Jumper Selectable 9V or 12V) • 1 Modular RS232 • 2 Combination RS232/RS422
Accessory Power	• 1 +9VDC @ 1.5A • 1 +12VDC @ 2.5A
USB Port	2 USB Ports
LAN Interface	10/100 Mbps Ethernet - RJ45
Input Voltage	Universal Input - 85 to 264VAC, 47 to 63Hz.
Input Power	6W Typical, 63W Maximum (+15VDC @ 4.2A) External AC Adapter

Operating Temperature	Without Battery Pack: -10°C (14°F), to 65°C (149°F), 90% relative humidity non-condensing at 65°C (149°F). With Battery Pack: Charging: 0°C (32°F) to 45°C (113°F) Discharging: -10°C (14°F) to 60°C (140°F)
Storage Temperature	Without Battery Pack: -20°C (-4°F) to 80°C (176°F) With Battery Pack: -5°C (23°F) to 30°C (86°F)
Setup Guide PN	100016-071
Application Support	https://portals.micros.com/hardware/SitePages/Home.aspx
HSG Portal Page	https://portals.micros.com/hardware/HSG/pages/KW270.aspx

Connectors

The Figure below points out the KW270 Modular COM ports, and lists the applicable IDN Patch Cables and RS232 Dongles.



	IDN Cable	RS232 Dongle
RS422A COM3	300319-036 (3ft) 300319-120 (10ft)	300319-102
RS422B COM4	300319-036 (3ft) 300319-120 (10ft)	300319-102
RS232 COM2	N/A	300319-103

Figure 13 – KW270 IO Panel Modular Connectors

AC Power Requirements

Preferred AC Power System - Chapter 3

LAN Requirements

Category 6 or better Face Plate and Patch Cable - Chapter 4

Legacy Workstations

The following workstations are no longer available but included for reference.

PCWS 2010

The PCWS 2010 is the recently discontinued predecessor to the PCWS 2015 and included for reference. The PCWS 2010 is an Adjustable Display design with a standard 12.1″ (left) or optional 15″ LCD (right). It uses two processors selected from the Intel Pentium M family.

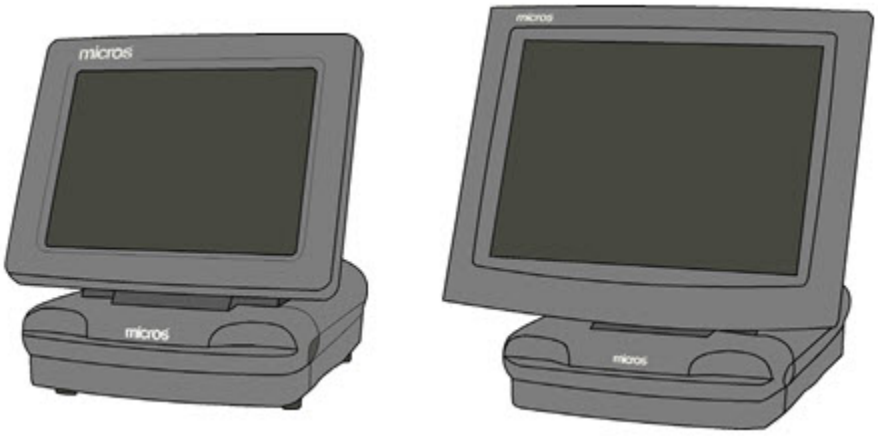


Figure 14 – PCWS 2010

Features

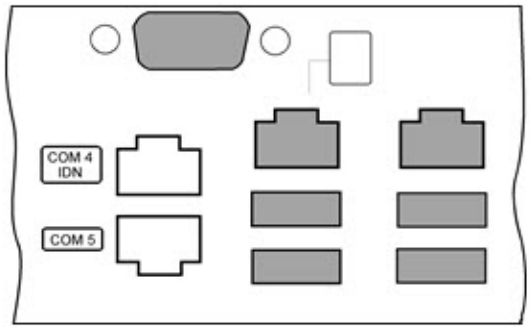
Table 8 – PCWS 2010 Features

Feature	Specifications
Display	Standard 800x600 12.1″ TFT Color LCD, Optional 1024x768 TFT Color LCD
Case Style	Adjustable Display
Case Material	PC-ABS Plastic
Weight (/w Hard Disk and VFD Display)	With 12.1″ LCD - 17 lbs. (7.7 Kg) With 15 LCD - 22.7 lbs. (10.3 Kg)
Physical Dimensions	See Appendix A
Customer Display	Integrated 2x20 VFD (IEE)
Optional Customer Displays (Series)	Pole 240x64 Graphics Capable Display with 2x20 emulation.
Cash Drawers	2 MICROS 4-Pin DIN Connectors - +12V or +24V Jumper Selectable.
LAN Interface	10/100 Mbps BaseT Ethernet
COM Ports	• 1 DB9 RS232 Serial • 2 Modular RS232/RS422

USB Port	4
AC Input Voltage	Universal 90-264VAC, 47-63GHz.
Input Power	46W Typical, 242W Maximum
Operating Temperature	0°C (32°F) to 45°C (113°F), 90% relative humidity max.
Storage Temperature	-25°C (-13°F) to 80°C (176°F)
Setup Guide PN	100016-142
Application Support	https://portals.micros.com/hardware/SitePages/Home.aspx
HSG Portal Page	https://portals.micros.com/hardware/HSG/pages/PCWS%202010.aspx

Connectors

The Figure below point out the PCWS 2010 modular COM ports and lists the applicable IDN Patch cables and RS232 Dongles.



	IDN Cable	RS232 Dongle
COM 4 IDN	300319-036 (3ft) 300319-120 (10ft)	300319-102
COM 5	N/A	300319-103

Figure 15 – PCWS 2010 IO Panel Modular Connectors

AC Power Requirements

Preferred AC Power System - Chapter 3

LAN Requirements

Category 6 or better Face Plate and Patch Cable - Chapter 4

Workstation 5

The Workstation 5 is diskless/fan-less embedded workstation that can run either Windows Embedded CE 6.0 or POS Ready 2009 (formally called WEPOS). Shown on the left is the Low Profile workstation, and on the right installed in the optional Adjustable Stand. The Workstation 5 is superseded by the Workstation 5A.

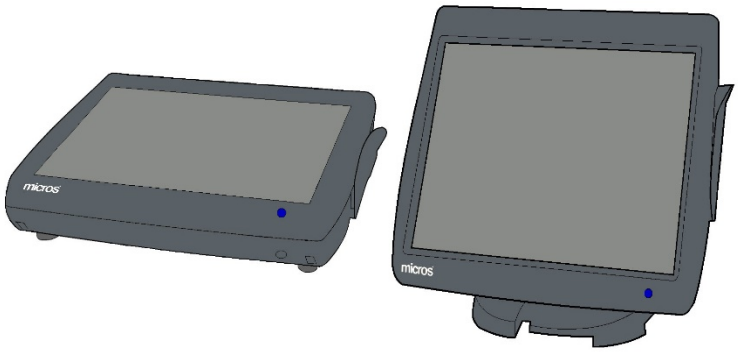


Figure 16 – Workstation 5

Features

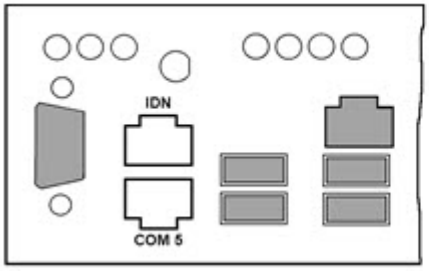
Table 9 – Workstation 5 Features

Feature	Specifications
Display	Standard 15″ 1024x768 TFT Color LCD
Case Style	Standard Low Profile or Optional Adjustable Stand
Case Material	PC-ABS Plastic
Physical Dimensions	See Appendix A
Optional Customer Displays (Series 1)	Integrated or Pole 240x64 STN Graphics Capable LCD Integrated or Pole Protege Customer Display System
Cash Drawers	2 MICROS 4-Pin DIN Connectors - +12V or +24V available
COM Ports	• 1 DB9 RS232 • 2 Combination RS232/RS422
USB Port	4
LAN Interface	10/100/1000 Mbps Ethernet - Modular RJ45
AC Input Voltage	Universal Input - 85 to 264VAC, 47 to 63Hz
Input Power	24W Typical
BTU/Hour	83 Typical
Operating Temperature	0°C (32°F) to 45°C (113°F), 90% relative humidity max.
Storage Temperature	-24°C (-13°F) to 80°C (176°F)
Setup Guide PN	100016-165

Application Support	https://portals.micros.com/hardware/SitePages/Home.aspx
HSG Portal Page	https://portals.micros.com/hardware/HSG/pages/Workstation%205.aspx

Connectors

The Figure below points out the Workstation 5 Modular COM ports, and lists the applicable IDN Patch Cables and RS232 Dongles.



	IDN Cable	RS232 Dongle
IDN	300319-036 (3ft) 300319-120 (10ft)	300319-102
COM 5	N/A	300319-103

Figure 17 – Workstation 5 IO Panel Modular Connectors

AC Power Requirements

Preferred AC Power System - Chapter 3

LAN Requirements

Category 6 or better Face Plate and Patch Cable - Chapter 4

Order Confirmation Controller

The Order Confirmation System consists of the in-store Order Confirmation Controller (OCC) connected to the curb-side Remote Display Pedestal. The OCC transmits VGA display data to the Remote Pedestal over twisted pair UTP cable.

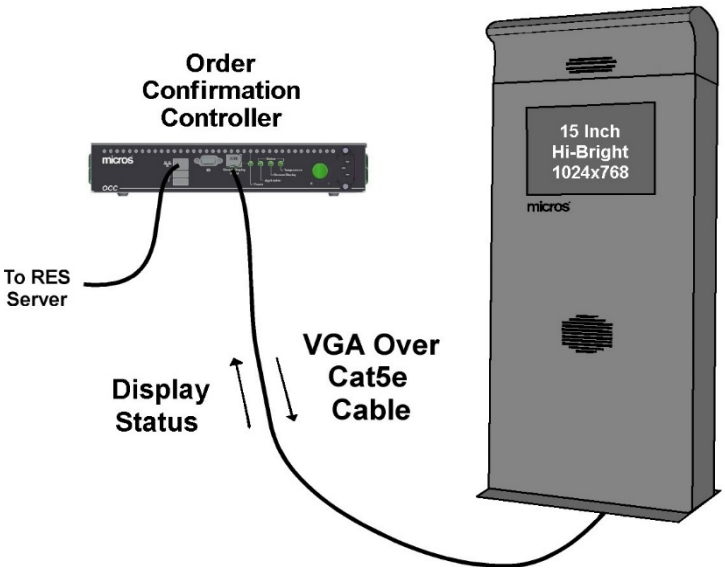


Figure 18 – Order Confirmation System

The Order Confirmation Controller is based on Windows Embedded CE 6.1 and supports an optional VGA monitor.

Order Confirmation Controller Features

Table 10 – Order Confirmation Controller Features

Feature	Specifications
Display	Local VGA and or Remote Display Unit
Case Material	Sheet Metal
Physical Dimensions	See Appendix A (Wall Bracket included)
Shipping Weight	7.7 lbs. (3.5 Kg)
USB Port	2
Serial Port	1 RS485 Half-Duplex Serial Channel to Remote Display Unit
LAN Interface	10/100/1000 Mbps Ethernet - Modular RJ45
AC Input Voltage	Universal Input - 85 to 264VAC, 47 to 63 Hz.
Input Power	13W Typical
Operating Temperature	0°C (32°F) to 45°C (113°F), 90@ relative humidity max
Storage Temperature	-25°C (-13°F) to 80°C (176°F)
Setup Guide PN	100016-173

Application Support	https://portals.micros.com/hardware/SitePages/Home.aspx
HSG Portal Page	https://portals.micros.com/hardware/HSG/pages/Order%20Confirmation%20System.aspx

AC Power Requirements

Preferred AC Power System, Chapter 3.

LAN Requirements

Category 6 or better Face Plate and Patch Cable - Chapter 4

Remote Display Unit Features

Table 11 – Order Confirmation Controller Features

Feature	Specifications
Display	15" (1024x768) TFT High-Bright LCD, 262K Colors Max
Case Material	Aluminum 5052
Physical Dimensions	See Appendix A
Shipping Weight	23.25 lb. (10.7 Kg)
Serial Port	1 RS485 Half-Duplex Serial Channel to OCC.
LAN Interface	None
Input Power	120VAC +/- 10%, 47 to 63Hz The RDU Heater and Pedestal Fans are 120 VAC Only
Operating Temperature	-20°C (-04°F) to 65°C (149°F), 90% Relative Humidity Max
Storage Temperature	-25°C (-13°F) to 80°C (176°F)
Setup Guide PN	100016-173
Application Support	https://portals.micros.com/hardware/SitePages/Home.aspx
HSG Portal Page	https://portals.micros.com/hardware/HSG/pages/Order%20Confirmation%20System.aspx

AC Power Requirements

Preferred AC Power System - Chapter 3.

LAN Requirements

Category 6 or better cable run between Order Confirmation Controller and Remote Display Pedestal - Chapter 4.

See Chapter 4 for more information about the Remote Pedestal Installation.

e7 BOC or Digital Menu and Marketing System Controller

The Lanner EM-F345 is a fan-less embedded system based on the Intel Atom N270. It is currently used as the e7 Back Office Controller (BOC) or the Digital Menu and Marketing System Controller (DDC).

Front and back views are shown below.

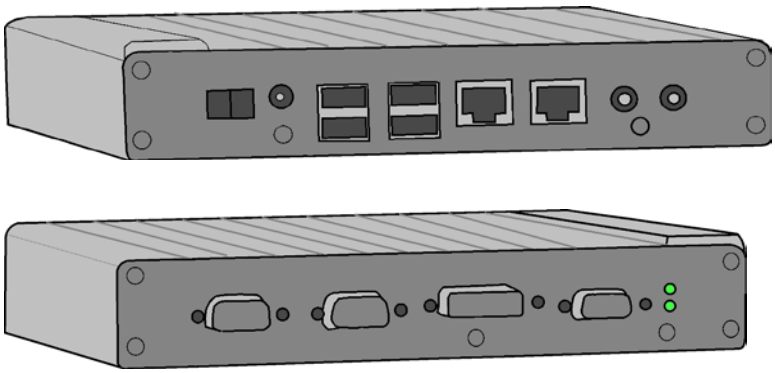


Figure 19 – Lanner EM-F345

Features

Table 12 – e7 BOC Features

Feature	Specifications
Display	1 VGA Port, 1 DVI-D Port (Dual Display)
Case Material	Sheet Metal
Weight	2.5 lbs. (1.07 Kg)
Physical Dimensions	145mm D, 190mm W, 36mm H
Mounting	Depends on Application
COM Ports	2 RS232/RS485/RS435
USB Ports	4
LAN Interface (2)	10/100/1000 Mbps Ethernet - Modular RJ45
AC Input Voltage	100 - 240VAC - 1.5A, 50 - 60Hz.
Input Power	60W Max

Operating Temperature	With Industrial Temp CF, Memory, and AC Adapter: -20°C (-4°F) to +50°C (122°F) With 2.5" Hard Disk Drive: 0°C (32°F) to 40°C (104°F)
Storage Temperature	-20°C (-4°F) to 70°C (158°F)
User Manual	https://portals.micros.com/hardware/3rdparty/pages/Digital%20Menu%20System.aspx

AC Power Requirements

e7 BOC or Digital Menu Board applications including all LCD monitors require the Preferred AC Power System - Chapter 3.

LAN Requirements

e7 BOC or Digital Menu and Marketing System applications require a Category 6 or better Face Plate and Patch Cable - Chapter 4.

Digital Menu and Marketing System LCD Monitors

The MICROS Digital Menu and Marketing System currently utilizes 40" or 46" Professional Grade LCD Monitors from NEC, designed for extended run times. Portrait and landscape mounting options are available. The monitors and mounting hardware are installed by NEC.

The Digital Menu System page of the HSG Portal can be found at this link:

https://portals.micros.com/hardware/3rdparty/pages/Digital%20Menu%20System.aspx

This page contains the 'MICROS Digital Menu and Marketing System Worksheet' that must be completed before the installation.

On this page you will also find documentation on the NEC Monitors and the Digital Display Controller.

PMA10-957 contains part numbers and pricing.

9700 NetCC2

The RoHS Compliant NetCC2 is based on an Avocent SuperSerial Ethernet to Serial Converter. In a 9700 system, it serves as an Ethernet to RS422 serial converter, providing up to 8 ports for driving MICROS IDN Devices.

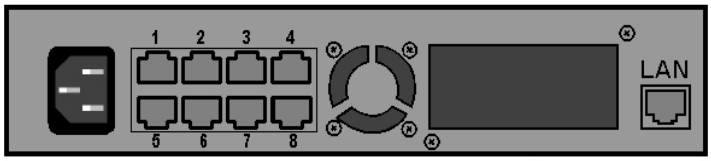


Figure 20 – 9700 NetCC2

Features

Table 13 – 9700 NetCC2 Features

Feature	Specifications
Case Material	Sheet Metal
Weight	3.5 lbs. (1.5 kg)
Physical Dimensions (Including Dongles)	420mm D, 220mm W, 42mm H (8.66" x 16.53" x 1.65")
Mounting	Wall or Shelf (Wall Mount Included)
COM Ports	8 RS422
LAN Interface (2)	10/100/1000 Mbps Ethernet - Modular RJ45
AC Input Voltage	100 - 240VAC - 50 - 60Hz - 0.5A
Operating Temperature	0°C (32°F) to 50°C (122°F)
Storage Temperature	-20°C (-4°F) to 70°C (158°F)
Documentation	MD0006-004 Rev C

AC Power Requirements

Preferred AC Power System - Chapter 3

LAN Requirements

Category 6 or better Faceplate and Patch Cable - Chapter 4

Printing Devices

A number of printing devices using a variety of interfaces are supported for such tasks as printing guest checks, order receipts, time cards, and reports. More information about the operational specifications of these printers can be found on the MICROS HSG Portal at:

https://portals.micros.com/hardware/3rdparty/pages/Epson%20Printers.aspx

From the site preparation perspective, three types of printers are supported, listed by interface. All printers should be connected to the Preferred AC Power System referenced in Chapter 3.

Ethernet

The Ethernet Module can be installed in any supported printer and supported by most Oracle MICROS application software. Also referred to an 'IP Printing,' these printers are connected to Ethernet in the same manner as a Workstation (e.g., Face Plates and Patch Cables at each location) as described in Chapter 4.

RS232

The RS232 Module can be installed in any supported printer and may be connected directly to a workstation or to a multi-port serial card installed in the server.

MICROS Integrated Device Network (IDN)

Using the IDN Module, all supported printers can be connected to the MICROS IDN.

- A "Local" IDN Printing device is connected directly to the workstation with an IDN patch cable.
- A "Remote" IDN network consists of a workstation driving one or more devices connected in a daisy chain over twisted pair cable at distances of up to 2500ft from the workstation. This configuration requires in-wall cable runs, faceplates, and patch cables at the workstation driving the network and as well as each device.

In addition, cabling the IDN can be implemented in one of two ways.

- Traditional MICROS IDN connection hardware and faceplates and MICROS approved RS422 twisted pair cable.
- Shielded Category 6 or better cabling and faceplates with MICROS IDN to ANSI/EIA/TIA-568-A patch cables.

IDN installation using one of the above methods is described in Chapter 4.

Peripheral Devices

With the exception of the Customer Displays and Cash Drawers, the peripheral devices listed below are connected to the Workstation through a RS232 interface.

Barcode Reader

A barcode reader allows an employee to post sales of merchandise (menu items) by scanning a generated barcode or the UPC (Universal Product Code) label which is printed on most products today. This is useful in a gift shop or other retail environment.

Cash Drawer

Your PC Workstation may have one or two Cash Drawers attached. Standard and Low Profile Cash Drawers are available. Programming determines which keys and which employees will open each drawer. Cash Drawers can also be locked or opened in emergencies with a cash drawer key.

MICROS currently uses APG 4000 Series Cash Drawers. For more information, see:

https://portals.micros.com/hardware/3rdparty/pages/Cash%20Drawers.aspx

Coin Changer

A coin changer is a device that issues the coin portion of a customer's change when the customer pays a check or transaction. The coin changer increases the employee's speed (no coins to count) and reduces mistakes caused by giving incorrect change. The Telequip T-Flex Coin Dispenser is available with an RS232 Interface and matching charcoal casework.

For more information, see:

https://portals.micros.com/hardware/3rdparty/pages/Telequip%20Coin%20Dispensers.aspx

Customer Displays

The customer display shows transaction totals and status. When a check is paid, the display shows the amount tendered and then any change due.

Both integrated and pole displays are available.

- Series 1 Integrated and Pole Displays where introduced around the same time as the KWS4 and Workstation 4 to match the colors and styling of this line of MICROS workstations. Series 1 displays are supported by the Workstation 5, 5A, PCWS 2015, and KW270.
    - 240x64 STN Graphics capable LCDs with 2x20 text capability.
- Series 1 Integrated or 6" pole mounted Protege Customer Display System. The Protege is an intelligent customer facing display based on a 7" 800x400 Color LCD. The Protege is compatible with all current and select MICROS legacy Workstations (the Workstation 4 LX and 5 require optional installation kits). For the Workstation 5A, PCWS 2015 and mStation, it connects to 'USB 5' on the IO Panel, a MICROS custom powered USB port that supplies 12V.
- Series 2 Integrated and Pole Displays match the colors and styling of the MICROS mStation and mTablet. The following displays are available.
    - 240x64 STN Graphics capable LCDs with 2x20 text capability.
    - 2x20 Text LCD.

Series 1 and 2 Integrated Customer Displays are supplied assembled with the appropriate mounting bracket. Series 1 Pole displays are available in sizes of 6, 12 and 18 inches, while the current Series 2 pole display is 6 inches. Series 1 and Series 2 pole display base use the same hole pattern. Mounting hardware is not supplied. In addition, APG 4000 Series Cash Drawers include the customer display base hole pattern.

https://portals.micros.com/hardware/HSG/pages/Customer%20Displays.aspx

Magnetic Card Reader

All MICROS workstations including the mTablet use a 3-Track American Bankers Association (ABA) compatible magnetic stripe reader.

It can be used to read customer credit cards and MICROS employee cards. Employee cards are used to sign employees on a workstation and enter manager authorization ID numbers.

The Workstation 5A, PCWS 2015 and mTablet MSRs are capable of encryption at the swipe using a Triple Data Encryption (TDES or 3DES) algorithm with Derived Unique Key Per Transaction (DUKPT) key rotation algorithm. The MSR is currently injected with a Merchantlink Key and shipped in non-encrypting mode.

MICROS Applications that support encryption will enable encryption at the start of POS operations.

Scale

The system allows you to integrate a scale, to be used with menu items that are priced by weight. The software can be programmed to calculate weight in pounds or kilograms. MICROS recommends the Metler Toledo Model 8217 scale with an RS232 interface.

Order Confirmation and Payment Terminal

MICROS currently uses the customer facing MX800 series of devices from VeriFone. More information can be found at the following link.

https://portals.micros.com/hardware/mobile/pages/VeriFone.aspx

Wireless Infrastructure

To service the MICROS mTablet, Mobile Workstations and desktop Workstations with an optional Wi-Fi card, one or more wireless access points may be required. Shown below are examples of the Symbol AP5131 AP and DT Research DT365 Tablet.

Figure 21 – Symbol Access Point and DT365 Tablet

The placement of Wireless Access Points at a given property should be determined through a site survey. Once a suitable location for each wireless access point is determined, the optional Power Over Ethernet (POE) cabling can be installed using the documentation supplied.

AC Power Requirements

Preferred AC Power System - Chapter 3.

LAN Requirements

Category 6 or better Face Plate and Patch Cable - Chapter 4.

Kitchen Display System (KDS)

The RES KDS system is composed of the Restaurant Display Controller (RDC), server based software and one or more PC based clients coupled with touch or non-touch based LCD monitors and bump bars that act as remote video displays.

Shown in the illustration below is a typical KDS system composed of the RDC, LCD touch monitor or non-touch LCD monitor with MICROS 10 or 20 Key Wired or Wireless Bump Bars.

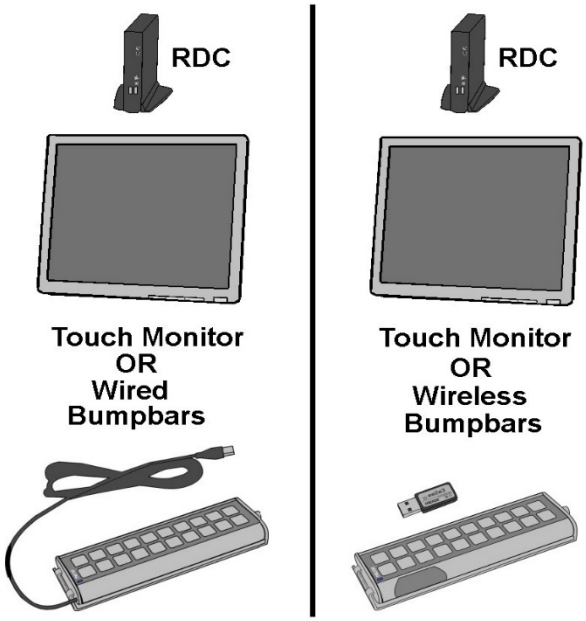


Figure 22 – KDS Components

The RDC and touchscreen monitor have the same AC Power and LAN Requirements as a MICROS workstation.

For more information about the features of this system, refer to the following HSG Portal Link: https://portals.micros.com/hardware/HSG/pages/KDS%20Hardware.aspx

AC Power Requirements

RDC and Monitor - Preferred AC Power System - Chapter 3.

LAN Requirements

The RDC requires a Category 6 or better Face Plate and Patch Cable - Chapter 4.

e7 Kitchen Video Display Controller

The e7 application utilizes the new e7 Kitchen Video Monitor (KVM) Controller. The figure below points out the components of this system including the host workstation, touch screen monitor or standard monitor with wired or wireless bump bars, e7 KVM Controller and optional printer.

The following figure shows the basic components of the e7 KVM System.

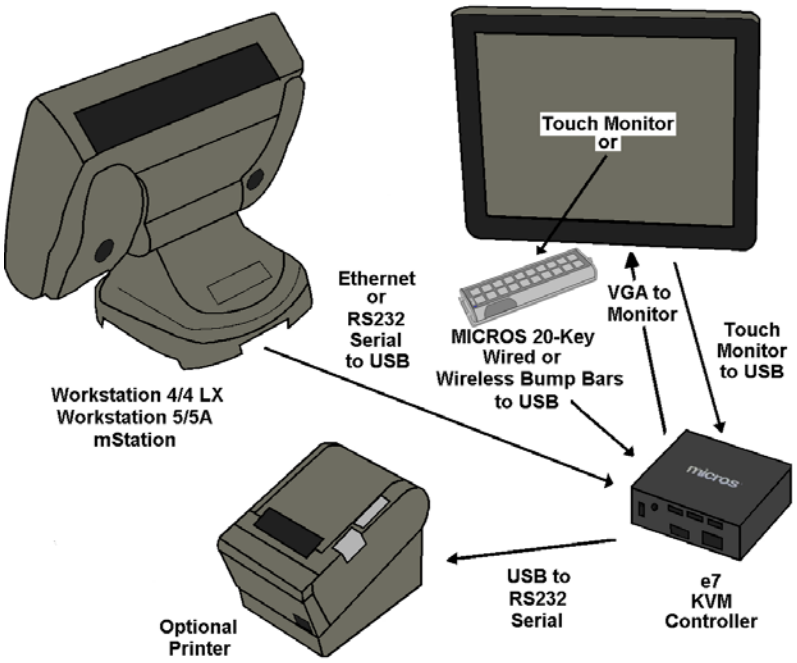


Figure 23 – The e7 Kitchen Video Monitor System

Features:

Table 14 – e7 KVM Controller Features

Feature	Specifications
Case Material	Aluminum
Weight	3.5 lbs. (1.5 kg)
Physical Dimensions	84mm D, 95mm W, 38mm H (3.30″ x 3.70″ x 1.50″)
Mounting	Shelf
Video Output	VGA
COM Ports	None
USB Ports	4 Type A, 1 Micro-B
LAN Interface	10/100/1000 Mbps Ethernet - Modular RJ45
External AC Adapter Input Voltage	100 - 240VAC, 50/60Hz, 0.5A
DC Input Voltage	5VDC, 2.5A
Operating Temperature	0°C (32°F) to 50°C (122°F)
Storage Temperature	-20°C (-4°F) to 70°C (158°F)
Documentation	Installation: MD0007-036

AC Power Requirements

KVM Controller and Monitor - Preferred AC Power System - Chapter 3.

LAN Requirements (If Used)

Category 6 or better Face Plate and Patch Cable - Chapter 4.

Functional Description

The host Workstation and e7 KVM Controller can connect in one of two ways:

- Ethernet - The host Workstation and e7 KVM Controller connect through an Ethernet switch.
- RS232 Serial - The host Workstation and e7 KVM Controller connect through a serial interface. Any available serial port can be used, DB9, RJ45 COM or the IDN port.

For more detail about the e7 KVM Controller serial interface to the host Workstation, including cable Part Numbers, refer to Chapter 4.

The host workstation is configured to drive a serial printer such as the TM U220. The e7 KVM Controller receives the print data over the Ethernet or Serial interface and reformats into the selected display format, described next.

The e7 KVM features three display configurations, listed below.

- 4 * 1 displays four tables with 22 lines available on each table.
- 4 * 2 displays eight tables with 8 lines available on each table.

Split screen with two 4 * 1 displays 4 tables from one device and four tables from another device each with 8 line available.

Orders are displayed as they are received (First-in-First-Display), with up to eight orders displayed at a time. If more than eight orders arrive before any are completed, they are buffered and appear as existing orders are completed. The scroll bar can be used to view the off screen orders.

If the order contains more lines that can fit in the allotted space, it continues into the next allotted space with a clear indication that the order is a continuation.

Each order displays the elapsed time (in MM:SS format), starting from when the e7 KVM controller receives the order. When an order is manually bumped or printed, the average processing time is displayed in the right corner of the screen.

Should a power failure occur, all orders are backed up in flash memory. By pressing one finger on the touch screen and moving to the left, the history order window appears. The history order displays in last-in-first-list format, i.e., the latest bumped/printed order will appear at the top of the list.

For bumping completed orders, options include a touch screen monitor or a standard monitor with MICROS 2x20 Wired or Wireless Bump bars. The touch screen monitor or bump bars connect to one of four USB ports on the e7 KVM Controller.

Optionally, a serial printer can be added and requires a USB to RS232 DB9 Serial Cable to connect to the KVM Controller.

2 Environmental Requirements

This chapter provides an overview of the environmental requirements for the Oracle MICROS POS equipment during operation and storage.

Equipment Placement Considerations

To ensure proper operation of the equipment, consider the following guidelines for equipment placement.

Location

- Appendix A contains dimensional information for each hardware device in the system.
- Locate all equipment so that it is accessible to service personnel.
- Tile is the recommended floor surface for areas surrounding the equipment. If the floor covering adjacent to the equipment is carpeted, an anti-static grade is recommended.
- If the carpeting surrounding the area housing the equipment is not composed of anti-static material, the use of static discharge mats is recommended. The recommended type of anti-static mat is one that incorporates a grounding clip with a cable, to attach the grounding electrode to earth ground.

Foreign Materials

Liquid spillage can cause damage to the circuits in the MICROS workstations and peripherals.

- Do not place the equipment near food preparation areas, glass racks, or water stations.

Another source of potential hazard to the equipment, especially printers, is solid matter, including paper clips, staples, or any other metallic objects.

- Safeguards should be taken to prevent the accidental dropping of any such materials into the equipment.

Noise Induction

In addition to the AC Power requirements outlined in Chapter 3, other sources of electromagnetic interference must be eliminated to ensure the trouble-free operation of the equipment.

- Noise radiating from AC power lines throughout a site can be absorbed by MICROS AC power and communications lines and induced into the equipment. Consequently, no exposed cable dedicated to the MICROS equipment should be run in the vicinity of any AC power lines.
- Devices that emit RF energy, such as cordless phones or walkie-talkies, should be kept at least 8 feet from the equipment or cable during operation.

Electrostatic Discharge

Electrostatic discharge (ESD) usually takes the form of a discharge from the operator's hand to the cash drawer, printer, or key switches. ESD is more common in dry climates during winter, and less common in moist climates.

MICROS hardware has been immunized to a level of up to 21,000 volts when the unit receives a discharge. Due to this level of immunization, the Workstations are protected against ESD in most environments. However, tile or anti-static carpet should still be employed in the areas near the equipment.

Humidity

A constant humidity between 40% and 80% is desired for the proper operation of the equipment.

Custom Cabinets and Enclosures

To maintain the internal temperature within the equipment at the specified levels, adequate ventilation is required. Consequently, the equipment must not be mounted in an enclosure that could impede air flow to all four sides. A three sided (front and back open) enclosure with 4 inches of clearance on all sides is acceptable.

Temperature

Operating and storage temperatures for current MICROS workstations are listed in Chapter 1 and summarized in the Table below.

Table 15 – Operating and Storage Temperatures for Current MICROS Workstations

Device	Operating Temperature	Storage Temperature
Desktop Workstation (WS5A, PCWS 2015/ WS4 LX)	0°C (32°C) - 45°C (113°F)	-25°C (-13°F) to 80°C (176°F)
KW270	Without Battery Pack: -10°C(14°F) to 65°C (149°F) 90% relative humidity non condensing at 65°C (149°F) With Battery Pack: Charging: 0°C (32°F) to 45°C (113°F) Discharging: -10°C (14°F) to 60°C (140°F)	Without Battery Pack: -20°C (-4°F) to 80°C (176°F) With Battery Pack[1]: -5°C (23°F) to 30°C (86°F)
mTablet	-10°C (14°F) to 60°C (140°F) When Charging Battery: 0°C (32°F) to 45°C (113°F)	-25°C (-13°F) to 85°C (185°F)
Concessions mTablet (No Battery)	-10°C (14°F) to 60°C (140°F)	-25°C (-13°F) to 85°C (185°F)

mStation	Without Battery Pack: -10°C (14°F) to 60°C (140°F) When Charging mTablet or optional mStation Battery Pack: 0°C (32°F) to 45°C (113°F)	Without Battery Pack: -25°C (-13°F) to 80°C (176°F) With Battery Pack[1]: -5°C (23°F) to 30°C (86°F)
Order Confirmation Pedestal Remote Display Unit	-35°C (-31°F) to 65°C (149°F)	-35°C (-31°F) to 80°C (176°F)

[1]See the Lithium Ion Battery Pack Storage Considerations section on the next page for more detail about storing batteries.

Lithium Ion Battery Pack Storage Considerations

The optional Lithium-Ion Totex Battery pack capacity will degrade over time. The mechanisms for capacity loss do not require the battery to be charged or discharged; capacity loss can also occur during storage.

In general, capacity loss during storage can be minimized removing the fully charged battery pack from the equipment and storing it at the lowest possible temperature for the shortest period of time. The storage environment must be low in humidity and free of corrosive gases.

If the battery pack is fully charged, removed from the equipment and stored at 20°C (68°F) or less it should have maximum shelf life of six months. If the storage temperature exceed 20°C (68°F) over a six month period, the shelf life can be reduced and we recommend that the battery pack be recharged periodically, or every 60 days.

If storing the battery for less than 30 days, the ideal temperature is between

-10°C (-14°F) and 35°C (95°F)

If storing the battery pack for greater than 30 days, but less than one year, the ideal temperature is -5°C (23°F) to 30°C (86°F)

Avoid storing the battery pack for extended period of time at temperatures greater than 45°C (113°F). If the battery is stored at temperatures exceeding 45°C (113°F) for six months, capacity loss can be as great as 10%.

3 AC Power Requirements

This chapter describes the AC power requirements for the Oracle MICROS hardware.

Overview

MICROS workstations are based on highly sophisticated hardware components that are designed to provide efficient and trouble-free operation.

Proper installation of the AC power and grounding system in accordance with the requirements contained in this chapter is essential to minimize the possibility of interference, and will enhance the performance and reliability of the hardware.

This chapter provides several methods for achieving the most cost effective and viable solution to the AC Power requirements of a MICROS POS System.

Recommended AC Power Methods

There are two approved methods for supplying AC power to the system. Each is described in the following pages.

Preferred AC Power System

To ensure that electrical noise produced by other equipment does not create interference for the system hardware, all power conductors and equipment grounding conductors must be isolated from other power circuits in the facility. To accomplish this, the preferred method of providing power is the installation of a power distribution panel intended for the sole use of the MICROS POS hardware.

This dedicated power panel shall not be used to supply other electrical loads in the facility. The panel will be supplied by a feeder run directly from the main or source panel for the facility.

Consult the *AC Power Consumption* section at the end of this Chapter to determine the maximum number of Personal Computers, PC Workstations, and/or Stand-alone devices to be powered from a single circuit.

See the figure below for an illustration of the preferred AC power system panel wiring. All branch circuits shall include a separate neutral and equipment grounding conductor unless otherwise indicated.

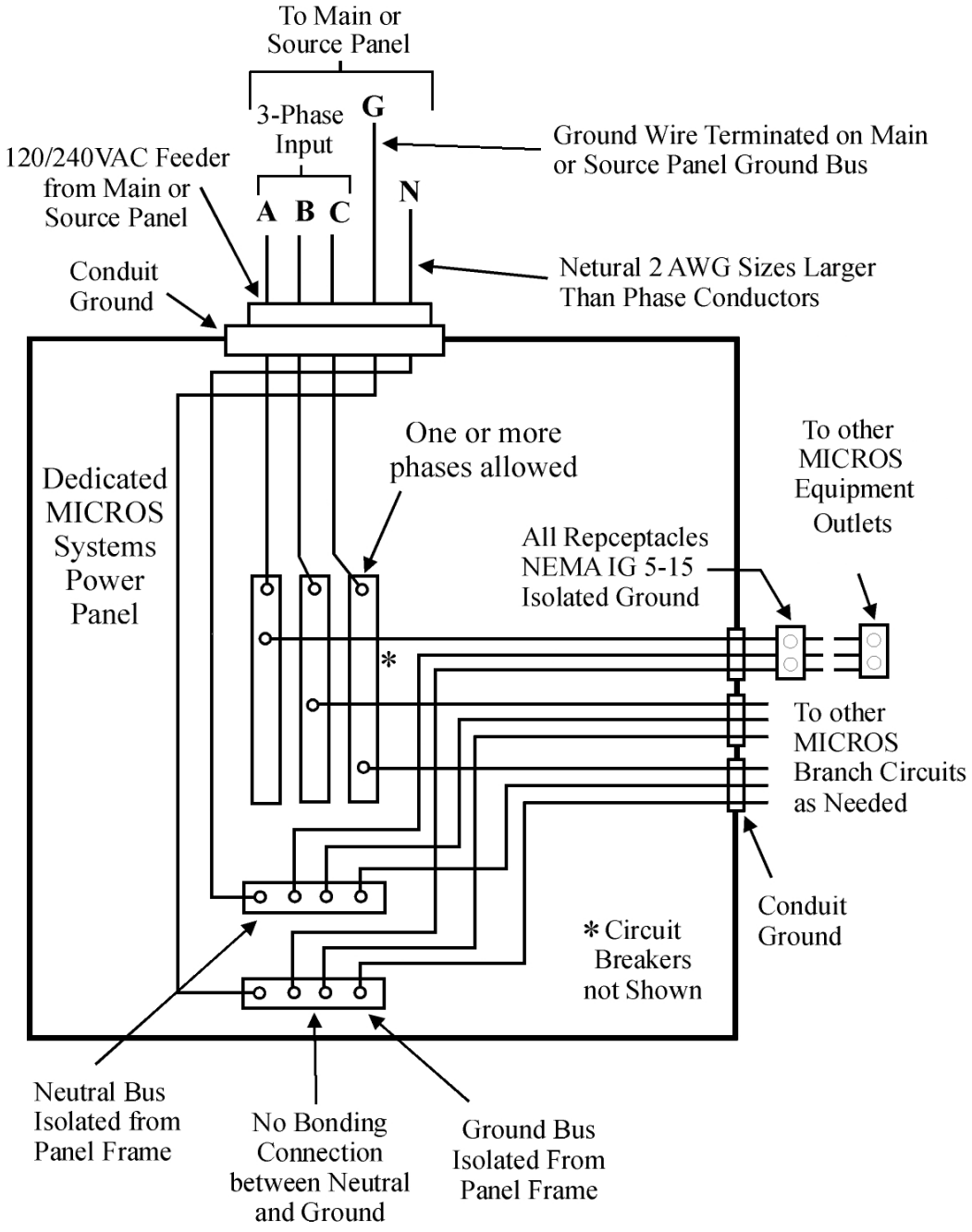


Figure 24 – Preferred AC Power System Panel Wiring

Notes on the Preferred AC Power System:

- The figure above does not supplant national, state, or local electrical codes.
- Each Branch Circuit shall be installed in a dedicated ferrous metal conduit and have separate neutral and ground conductors. Aluminum conduit is not acceptable.
- If the length of a branch circuit exceeds 100 feet, increase all conductors (including ground) one wire size for each additional 100 feet of length.

- The neutral conductor from the main or source panel to the dedicated MICROS panel is two sizes larger than the phase conductors. The larger wire size is necessary to accommodate the third harmonic current caused by the switching power supplies in the MICROS equipment, and to minimize the possibility of common mode noise occurring on the power distribution circuits.
- All power distribution circuits shall be installed in a dedicated ferrous metal conduit that contains only the MICROS supply and ground conductors. Data communication cables shall be installed in separate ferrous metallic conduits. See Chapter 4 for more information about installing the data communications cables.
- All AC Power Receptacles shall be the isolating ground type and shall be installed in accordance with the specifications contained in the *AC Power Receptacles Grounding* section.
- MICROS approved Uninterruptable Power Supplies (UPS) are required for each Server.

Despite the proper installation of the Preferred AC Power System, it is possible that power problems could be generated by the power company or by other equipment in the building. Should this occur, MICROS approved Power Conditioners or some other corrective measures may be required.

AC Power System Grounding

MICROS Power Panel Grounding

An insulated equipment grounding conductor (sized the same as the supply conductors) shall be installed in the same conduit as the supply conductors from the main or source panel to the dedicated MICROS POS equipment panel. This equipment grounding conductor is to be terminated on the ground bus in the main panel. At the MICROS POS equipment panel, install a ground bus that is electrically isolated from the panel frame and terminate the feeder equipment grounding conductor on this bus bar. The metallic feeder conduit will be used as the equipment grounding system for grounding the AC power panel frame, metallic conduit system, and metallic junction boxes.

MICROS Branch Circuit Grounding

Each branch circuit from the dedicated power panel to the device receptacles shall include a full size (same as supply conductors) insulated equipment grounding conductor installed in the same conduit as the supply conductors. The conduit must be dedicated to MICROS equipment. This isolated grounding conductor shall be terminated on the isolated ground bus bar in the panel and on the equipment grounding terminal of a NEMA IG5-15 isolated grounding type receptacle.

AC Power Receptacles Grounding

In order to maintain isolation of the equipment grounding conductor from the conduit system, an isolated ground receptacle must be used. This type of receptacle (usually identified by an orange face) provides an insulating barrier between the equipment grounding terminal and the receptacle mounting strap. All branch circuits from the MICROS power panels must be terminated with isolated ground receptacles.

Standard receptacles bond the equipment grounding terminal (green screw) to the receptacle mounting strap and metallic conduit when the receptacle is mounted to the

box. This defeats the purpose of the isolated grounding system. No equipment bonding jumper is to be installed from the receptacle grounding terminal to the outlet box.

NOTE: NEC Article 250-74, Exception 4 permits installation of the isolated ground receptacles and isolated equipment grounding conductors specified in this section.

If a duplex receptacle is installed and only one socket is to be used, the unused socket should be disconnected. This is to prevent the temptation of using the outlet for equipment that may produce extraneous ground currents (e.g., floor buffers, blenders, vacuum cleaners, etc.). The correct isolated ground receptacle types are listed below.

Table 16 – Isolated Ground Receptacles

Receptacle Type	NEMA PN
125V., 15A., Simplex	IG5-15R1
125V., 15A., Duplex	IG5-15R2

Additional Methods for AC Power

The following sections provide alternate methods of supplying AC power to the MICROS POS System.

Relaxed/Power Conditioned AC Power System

When providing the Preferred AC Power System is cost prohibitive and/or would require major structural changes, we have defined a relaxed AC Power System based on MICROS Approved Power Conditioners. **However, the Preferred AC Power System is recommended by MICROS.**

If utilized, the Relaxed/Power Conditioned AC Power System requires completion of the AC Power Agreement on page 50.

The Relaxed/Power Conditioned AC Power System is described as follows:

- MICROS-approved Power Conditioners are required at **all** MICROS equipment locations.
- MICROS-approved Uninterruptable Power Conditioners (UPC) are required at each server.
- All MICROS AC Power branch circuits must originate from the same "Non-Dedicated" Power Panel. This Panel must be equipped with an "isolated" ground bus that is electrically isolated from the panel frame and must be provided with an insulated equipment grounding conductor (sized the same as the supply conductors) which is installed in the same conduit as the supply conductors from the main or source power panel. The equipment grounding conductor must be terminated on the ground bus in the main or source panel and on the "isolated" ground bus in the "Non-Dedicated" Power Panel.
- Any Power Panel supplying heavy equipment within the facility should not be selected as the "Non-Dedicated" Power Panel supplying the MICROS equipment.
- MICROS AC Power Circuits must be "dedicated" for MICROS equipment. No equipment other than MICROS equipment may be supplied by these "dedicated" circuits.

- MICROS AC Power Circuits must also be installed in a dedicated conduit system. No circuits other than MICROS circuits may exist in this dedicated conduit system. In addition, the conduit used for the MICROS AC Power Circuits must be ferrous metallic. Flexible, rigid, or greenfield metallic conduit is acceptable. **Aluminum conduit is not acceptable.**
- Each "dedicated" MICROS AC Power circuit must include a full size (same as supply conductors) insulated equipment grounding conductor installed within the same "dedicated" conduit system as the supply conductors. This ground conductor must be terminated at the "isolated" ground bus in the "Non-Dedicated" Power Panel, and on the grounding terminal of each Isolated Ground AC Power Receptacle.
- All AC Power Receptacles shall be the isolating ground type and shall be installed in accordance with the specifications contained in the *AC Power Receptacles Grounding* section.
- When choosing a base, mid-level, or premium Power Conditioning system, an upgrade to the next level may be required should problems arise. This could be due to power problems generated by the power company or other equipment in the building.

Power Conditioned AC Power System

This method is an acceptable alternative when the Preferred, or Relaxed/ Power Conditioned AC Power System is cost prohibitive and/or would require major structural changes. **However, the Preferred AC Power System is recommended by MICROS.**

If utilized, the Power Conditioned AC Power System requires completion of the AC Power Agreement immediately following.

The Power Conditioned AC Power System is described as follows:

- MICROS-approved AC Power Conditioners are required at **all** MICROS equipment locations.
- MICROS-approved Uninterruptable Power Conditioners (UPC) are required at **each** server.
- Whenever possible, all MICROS equipment should be installed on the same sub panel. However, MICROS equipment can be supplied by different "non-dedicated" AC power sub panels, but the sub panels should be supplied by the same main or source panel. If multiple main or source panels are utilized, ground potential problems could arise and severely degrade the performance of the system, even if AC power conditioners are used. Line Drivers or Optical Isolation Devices may be required on selected data transmission cable runs to eliminate the effects of ground potential problems.
- Whenever possible, any Power Panel supplying heavy equipment within the facility should not be selected as the power panel supplying MICROS AC Power Circuits. Equipment problems resulting from utilizing a Power Panel supplying heavy equipment will be reviewed on an individual basis.
- When choosing a base, mid-level, or premium Power Conditioning system, an upgrade to the next level may be required should problems arise. This could be due to power problems generated by the power company or other equipment in the building.

AC Power Agreement

On the following page, you will find the MICROS Systems, Inc. AC Power Agreement. This agreement is for the purpose of explaining the recommended AC Power Requirements for the MICROS Workstations, Printers, Servers and related hardware. After you have read this agreement, please sign and return it to your MICROS representative.

MICROS SYSTEMS, INC.

RELAXED/POWER CONDITIONED & POWER CONDITIONED AC POWER AGREEMENT

This Agreement is made between MICROS Systems, Inc. or an authorized MICROS Representative (collectively, "MICROS") and the MICROS Customer (the "Customer") for the purpose of explaining the recommended AC Power Requirements for the MICROS related hardware. MICROS endeavors to ensure that the Customer's MICROS POS System provides efficient trouble-free operation. To accomplish this, careful attention must be given when the Customer is selecting the Relaxed/Power Conditioned or Power Conditioned AC Power System (the "AC Power System").

When selecting the AC Power System for the MICROS POS System and its related hardware as identified below, the Customer understands and acknowledges that:

1.0 The Preferred AC Power System described in the *MICROS Hardware Site Preparation Guide* (as attached hereto) are recommended by MICROS.

2.0 When utilizing the Relaxed/Power Conditioned or Power Conditioned AC Power Systems, MICROS approved Power Conditioners are required at all equipment locations comprising the MICROS POS System. In addition, MICROS approved Uninterruptable Power Conditioners (UPC) are required for each POS System Server.

3.0 When utilizing the Power Conditioned AC Power System and whenever possible, the AC Power Panels feeding the MICROS related hardware (comprising the MICROS POS System) will be supplied by the same main or source AC Power Panel. In the event multiple main or source AC Power Panels are utilized, ground potential problems could severely degrade the performance of the MICROS POS System (even with Power Conditioners). Line Drivers or Optical Isolation Devices may be required on selected data transmission cable runs to eliminate the effects of ground potential problems. The Relaxed/Power Conditioned AC Power System requires the use of the same "Non-Dedicated" AC Power Panel for **all** MICROS related hardware.

4.0 All specifications for the AC Power System contained in the *MICROS Hardware Site Preparation Guide* shall be followed when installing the chosen AC Power System. Failure by the Customer to do so may result in the voiding of any applicable MICROS hardware warranty and/or may jeopardize future coverage under a maintenance agreement.

5.1 MICROS is not liable to the Customer or any other party under any circumstances for any damages, claims, losses or expenses, arising from, related to, or caused by AC Power related disturbances.

PAGE 2 OF 2
MICROS SYSTEMS, INC.
AC POWER AGREEMENT

Please indicate your understanding and commitment to providing an AC Power System that meets the MICROS specifications contained in the *Oracle MICROS Hardware Site Preparation Guide* by signing below and returning to your MICROS representative.

MICROS REPRESENTATIVE	CUSTOMER REPRESENTATIVE
_____	_____
	Site: _____
Accepted:	Accepted:
By:_____ Authorized Signature	By:_____ Authorized Signature
_____ Type or Print Name	_____ Type or Print Name
Title: _____	Title: _____
Date:_____	Date: _____

Recommended AC Power Conditioning and UPS Equipment

This section presents on overview of the UPS and power conditioning equipment available for the chosen AC Power System outlined in Chapter 3 of this MICROS Hardware Site Preparation Guide. Failure by the Customer to do so may result in the voiding of any applicable MICROS hardware warranty and/or may jeopardize future coverage under a maintenance agreement.

Several PowerVar UPS and power conditioning products are available, including the new Grounding Technology Solutions (GTS). The new GTS series features a surge diverter, noise filter and low impedance isolation transformer to guarantee fully conditioned power.

Uninterruptable Power Supplies

UPS Product Requirements

MICROS POS Systems require the use of a MICROS approved UPS on each server. This is required by the nature of the operating system used by some MICROS applications. In the event of a power failure, the server may be vulnerable to significant file and or directory damage. To protect against this occurrence, back-up power must be applied so that an orderly shutdown of the operating system can take place.

PowerVar Single Phase UPS Desktop Models

PowerVar has improved its innovative and successful family of power protection products with the addition of Grounding Technology Solutions (GTS) Series product family - an isolated true sine-wave UPS System. The GTS series includes a surge diverter, noise filter and low impedance isolation transformer to guarantee fully conditioned isolated power whether operating on the utility or battery. The GTS series prevents the occurrence of ground loops and makes dedicated-isolated electrical circuits obsolete.

- Product sizes range from 250 VA to 800 VA
- Built-in grounding technology to prevent ground loops
- Low impedance isolation transformer and line interactive operation
- Let through voltage of less than 10V normal mode and less than 0.5 volts neutral-to-ground when tested to ANSI/IEEE C62.41.

The figure below shows the available Desktop UPS models with the VA rating, output current, number of outlets, and typical applications for MICROS equipment.

PowerVar Single Phase Desktop UPS Models			
ABCEG251-11 PN 700247-092	**ABCEG401-11 PN 700247-093**	**ABCEG601-11 PN 700247-094**	**ABCEG800-11 PN 700247-095**
Power Rating: VA/Watts: 250/200 Output Current: VA/Watts: 2.0/1.6A Outlets: 4 Applications: > mStation > WS5A > PCWS 2015 > WS5 > KW270 > HP RP5800 > HP Pro 6305	Power Rating: VA/Watts: 400/320 Output Current VA/ Watts: 3.3/2.6A Outlets: 4 Applications: > Same as PN 700247-092 but with greater capacity for more than one system.	Power Rating: VA/Watts: 600/480 Output Current VA/ Watts: 5.0/4.0A Outlets: 8 Applications: > HP ML310 > HP ML350 > Monitors	Power Rating: VA/Watts: 800/560 Output Current VA/Watts: 6.7/4.7A Outlets: 6 Applications: > HP ML310 > HP ML350 > Monitors

Figure 25 – Recommended PowerVar Single Phase Desktop UPS Models

During the transition from ONEAC to PowerVar, new part numbers were created. The table below displays the old part numbers, then the new description and Part Number for Single Phase Desktop UPS Products.

Table 17 – Desktop UPS Part Numbers and Descriptions

Old PN	Uninterruptable Power Supplies (UPS) Description	New PN
700247-055	UPS, 200W, POWERVAR ABCEG251-11	700247-092
700247-056	UPS, 320W, POWERVAR ABCEG401-11	700247-093
700247-057	UPS, 480W, POWERVAR ABCEG601-11	700247-094
700247-061	UPS, 560W, POWERVAR ABCEG800-11	700247-095

ONEAC Rack Mount UPS

ONEAC Rack Mount UPS		
ON1000XAU-SN PN 700247-047	**ON1500XAU-SN PN 700247-064**	**ON2000XAU-SN PN 700247-065**
Capacity: 1000VA/ 700W Outlets: 8 Application: > Server Rack	Capacity: 1440VA/1000W Outlets: 8 Application: > Server Rack	Capacity: 1920VA/ 1345W Outlets: 8 Application: Server Rack

Figure 26 – Recommended PowerVar Single Phase Desktop UPS Models

Rack Mounted UPS MICROS Part Numbers and Descriptions can be found in the table below.

Table 18 – Rack Mounted UPS Part Numbers and Descriptions

PN	Rack Mount UPS
700247-047	1000VA/700W, UPS RACK MOUNT, ON1000XAU-SN
700247-064	1440VA/1000W, UPS RACK MOUNT, ON1500XAU-SN
700247-065	1920VA/1345W, UPS RACK MOUNT, ON2000XAU-SN

Standard Power Conditioners

The standard Power Conditioner features a low-impedance isolation transformer to protect the equipment from common-mode voltage, which can cause everything from equipment lock-ups to data losses and more. These models also feature surge suppression and power line filters to eliminate noise, spikes and transients before they have a chance to damage equipment.

- All North American models have UL and cUL listings. International Models are safety agency listed and carry the CE mark.
- Let-through voltage is <10 Volts normal mode and < .5 volts neutral to ground when tested to ANSI/IEEE C62.41.
- Red flashing LED (Amber for international models) warns if the AC outlet is missing its input safety ground.
- PowerVar's five-year warranty on parts and labor.

Wall Mount POWERVAR Standard Power Conditioners				
ABC065-11W PN 700247-074	**ABC100-11W PN 700247-076**	**ABC150-11W PN 700247-078**	**ABC202-11W PN 700247-077**	**ABC302-11W PN 700247-079**
Watt/VA: 78 Amps: 0.65 Outlets: 2 Application: > KDS > mStation > Monitor	Watt/VA: 120 Amps: 1.0 Outlets: 2 Application: > PWCS 2015 > WS5A > KW270	Watt/VA: 180 Amps: 1.5 Outlets: 4 Application: > PCWS 2015 + Thermal Printer	Watt/VA: 240 Amps: 2.0 Outlets: 4 Application: > Back Office RP5800 + Printer	Watt/VA: 360 Amps: 3.0 Outlets: 4 Application: > Multiple PCWS > HP Server

Figure 27 – Approved PowerVar Standard Power Conditioners

During the transition from ONEAC to PowerVar, new part numbers were created. The table below displays the old MICROS part numbers, then the new description and Part Numbers for the recommended Standard Power Conditioners.

Table 19 – Approved Standard Power Conditioners Part Numbers and Descriptions

Old PN	Uninterruptable Power Supplies (UPS) Description	New PN
700247-017	78VA-0.65A Line Conditioner, 2 Plug, ABC065-11W	700247-074
700247-018	120VA-1.0A Line Conditioner, 2 Plug, ABC100-11W	700247-076
700247-020	180VA-1.5A Line Conditioner, 4 Plug, ABC150-11W	700247-078
700247-019	240VA-2.0A Line Conditioner, 4 Plug, ABC202-11W	700247-077
700247-021	360VA-3.0A Line Conditioner, 4 Plug, ABC302-11W	700247-079

POWERVAR Ground Guard Line Conditioners

PowerVar Ground Guard power conditioners provide benefits beyond those of traditional power conditioning products. Filter elements in the safety ground circuit prevent the formation of "ground loops," which are common in networked applications.

The "ground conditioning" feature combined with a high energy surge suppressor and a power line filter eliminates the need for both dedicated electrical circuits and isolated ground wiring. Ground Guard carries six U.S. and international patents.

- Patented Ground Guard conditioning circuitry eliminates ground loops
- Red LED (Amber for international models) flashes if AC outlet is missing its input safety ground.

- Let-through voltage is <10 volts normal mode and <.5 volts neutral to ground when tested to ANSI/IEEE C62.41.
- POWERVAR`s five-year warranty on parts and labor.

Wall Mount POWERVAR Ground Guard Conditioners				
ABCG065-11W PN 700247-075	**ABCG100-11W PN 700247-080**	**ABCG152-11W PN 700247-081**	**ABCG202-11W PN 700247-082**	**ABCG302-11W PN 700247-083**
Power Rating: Watt/VA: 78 Amps: 0.65 Outlets: 2 Application: > mStation	Power Rating: Watts/VA: 120 Amps: 1.0 Outlets: 2 Application: > PCWS 2015 > WS5/WS5A > KW270	Power Rating: Watts/VA: 180 Amps: 1.5 Outlets: 4 Application: > PCWS 2015 and Printer > Monitors	Power Rating: Watts/VA: 240 Amps: 2.0 Outlets: 4 Application: > Back office RP5800 and printer.	Power Rating: Watts/VA: 360 Amps: 3.0 Outlets: 4 Application: > Multiple PCWS > HP Server

Figure 28 – Approved PowerVar Ground Guard Power Conditioning

During the transition from ONEAC to PowerVar, new part numbers were created. The table on the next page lists the old MICROS part numbers, then the new description and MICROS PN for Ground Guard Line Conditioners.

Table 20 – Approved Ground Guard Power Conditioners Part Numbers and Descriptions

Old PN	Uninterruptable Power Supplies (UPS) Description	New PN
700247-041	78VA-065A Ground Guard Conditioner, 2 Plug, ABCG065-11W	700247-075
700247-040	120VA-1.0A Ground Guard Conditioner, 2 Plug, ABCG100-11W	700247-080
700247-042	180VA-1.5A Ground Guard Conditioner, 4 Plug, ABCG152-11W	700247-081
700247-043	240VA-2.0A Ground Guard Conditioner, 4 Plug, ABCG202-11W	700247-082
700247-060	360VA-3.0A Ground Guard Conditioner, 4 Plug, ABCG302-11W	700247-083

Smart Power Filters

The figure below shows the available Smart Power AC Line Filters. Each offers three outlets in a compact solution for installation behind a large screen monitor.

Smart Power Filters	
FS11005A-S3SB PN 700247-073	**FS11007A-S3SB 700247-072**
Capacity: 5 Amps Outlets: 3 Application: > Menu Boards > Phone, data and power line protection - including POTS and ADSL	Capacity: 7 Amps Outlets: 3 Application: > Menu Boards > Phone, data and power line protection - including POTS and ADSL

Figure 29 – Approved Smart Power Filters

The figure below, is an example of a Smart Power Filter installed on the Menu Board Mounting Bracket.

Figure 30 – Smart Power Filter Installation on Menu Board Mounting Bracket

Ethernet Line Protectors

Surface or rack mounted chassis with 5, 10, or 16 slots for RM-ELP100 Ethernet Protector modules. See the table below for MICROS Part Numbers and descriptions.

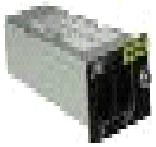
Ethernet Line Protector MTJ-C6	Ethernet Protector - Surface or Rack Mount RM-5, RM-10, RM-16	Rack Module RM- ELP100
		
10/100/1000 Mbps / w RJ45 connector	Multi-Slot Chassis – Populate with RM- ELP100	Use with RM-5, RM- 10, or RM-16
PN 700247-211	PN 600471-211 (5-Slot Surface Mount) PN 600471-210 (10-Slot Surface Mount) PN 600471-212 (16-Slot Rack Mount)	PN 700247-210

Figure 31 – Ethernet Line Protectors

Table 21 – Power Filters and Ethernet Line Protection Devices

MICROS PN	Description
700247-073	POWER FILTER, ONEAC SLIMtec - 5AMP, 2 OUTPUTS, 3- PLUG, DATA LINE PROTECTION
700247-072	POWER FILTER, ONEAC SLIMtec - 7AMP, 2 OUTPUTS, 3- PLUG, DATA LINE PROTECTION
700247-211	ETHERNET LINE PROTECTOR, 1GB, RJ45, POWERVAR MTJ-C6,24025-00 (Replaces PN 700247-201)
600471-211	ENCLOSURE FOR ETNERNET DATA LINE PROTECTOR (PN 700247-210), 5-SLOT, ONEAC RM-5
600471-210	ENCLOSURE FOR ETNERNET DATA LINE PROTECTOR (PN 700247-210), 10-SLOT, ONEAC RM-10
600471-212	ENCLOSURE FOR ETNERNET DATA LINE PROTECTOR (PN 700247-210), 16-SLOT, ONEAC RM-16
700247-210	ETHERNET DATA LINE PROTECTOR W/6' PATCH CABLE, NO WISP, ONEAC RM-ELP100

PowerVar Single Phase Desktop UPS - Estimated Run Times

The following tables show estimated run times based on the load in percent of the four approved single phase desktop UPS systems.

The amount of back-up time available is directly related to the VA rating of the UPS utilized. The closer you get to the rated capacity of the UPS, the less back-up time you will have.

Battery age must also be considered. The runtimes shown in the tables are estimates from PowerVar using new, fully charged batteries at an ambient temperature of 25°C.

Depending on the operating environment, UPS batteries can lose between 20% and 40% of their capacity after three years. A typical shutdown may take several minutes to perform therefore careful consideration must be given to UPS capacity vs. battery life.

Table 22 – Estimated Load Times of ABCEG251-11 - (PN 700247-092)

ABCEG251-11 - (PN 700247-092)											
Load	%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
	Volts	121	122	122	122	122	122	122	122	122	121
	Amps	0.15	0.30	0.44	0.59	0.74	0.87	1.01	1.17	1.31	1.46
	Watts	17.5	3	52.5	70	87.5	105	122	140	158	175
Run Time	Min-utes	**140**	**48**	**56**	**43**	**23**	**19**	**16**	**13**	**12**	**10**

Table 23 – Estimated Load Times of ABCEG401-11 - (PN 700247-093)

ABCEG401-11 - (PN 700247-093)											
Load	%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
	Volts	122	121	120	121	122	121	121	121	120	119
	Amps	0.24	0.46	0.70	0.92	1.15	1.40	1.63	1.88	2.10	2.36
	Watts	28	5	84	112	140	168	196	224	252	280
Run Time	Min-utes	**65**	**30**	**28**	**19**	**15**	**13**	**11**	**8**	**7**	**6**

Table 24 – Estimated Load Times of ABCEG601-11 - (PN 700247-094)

ABCEG601-11 - (PN 700247-094)											
Load	%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
	Volts	122	122	121	121	121	122	121	121	116	114
	Amps	0.35	0.69	1.04	1.39	1.74	2.07	2.44	2.78	3.26	3.66
	Watts	4	84	126	168	210	252	294	336	378	420
Run Time	Min-utes	**90**	**55**	**39**	**30**	**24**	**18**	**14**	**11**	**19**	**7**

Table 25 – Estimated Load Times of ABCEG800-11.- (PN 700247-095)

ABCEG800-11.- (PN 700247-095)											
Load	%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
	Volts	118	119	118	118	117	119	118	118	118	120
	Amps	0.44	0.87	1.32	1.76	2.21	2.63	3.08	3.52	3.94	4.36
	Watts	5	110	165	224	280	335	395	450	500	560
Run Time	Min-utes	**77**	**46**	**32**	**23**	**17**	**14**	**11**	**10**	**8**	**6**

Dimensions and Shipping Weight

The table below displays dimensions and shipping weights for the recommended UPS Systems, Ground Guard and Standard Line Conditioners.

Table 26 – Recommended AC Power Conditioning Equipment - Dimensions and Shipping Weights

MICROS PN	POWERVAR Model Number	Height (Inches)	Width (Inches)	Depth (Inches)	Ship Weight (lbs.)
700247-092	ABCEG251-11	6.60	5.00	13.39	23
700247-093	ABCEG401-11	6.60	5.00	15.06	28
700247-094	ABCEG601-11	8.02	5.76	15.48	33
700247-095	ABCEG800-11	8.00	5.80	17.50	47
700247-075	ABCG065-11W	4.23	4.97	7.58	5
700247-080	ABCG100-11W	4.23	4.97	7.58	7
700247-081	ABCG152-11W	4.23	4.97	7.58	8
700247-082	ABCG202-11W	4.23	4.97	7.58	9
700247-083	ABCG302-11W	4.23	4.97	7.58	11
700247-074	ABC065-11W	3.61	4.25	6.74	5
700247-076	ABC100-11W	3.61	4.25	6.74	6
700247-078	ABC150-11W	3.61	4.25	6.74	6
700247-077	ABCG202-11W	4.23	4.97	7.58	9
700247-079	ABCG302-11W	4.23	4.97	7.58	11
700247-047	ON1000AXU-SN	3.50	17.25	19.5	65
700247-064	ON1500AXU-SN	3.40	17.30	20.2	71
700247-065	ON2000XAU-SN	6.90	17.30	20.2	112

700247-211	MTJ-C6	1.02	1.46	3.62	N/A
600471-211	RM-5	1.72	5.95	4.15	1.38
600471-210	RM-10	1.72	10.95	4.15	2.21
600471-212	RM-16	1.72	17.18	4.15	3.27

AC Power Consumption

The following information is provided to assist in calculating the UPS and power conditioner size requirements. The ratings for MICROS workstations and peripheral equipment are close to actual. When using the actual ratings, it is advisable to add 20% to the total to account for variations in your systems power consumption.

Volt-Amp Ratings for MICROS Equipment

The Ampere and Volt-Ampere ratings listed below assume a 120Volt AC ~10%, single phase, 60 Hz ~3% input.

Table 27 – AC Power Consumption of MICROS Hardware Devices

Device	Amp (A)	VA (VA)	Backlight ON (W)/(A)/(VA)	Backlight Off (W)/(A)/(VA)
MICROS Workstations				
Workstation 4/4 LX	0.22	26	22/0.22/26	15/0.15/18
Workstation 5	0.30	35	23/0.30/35	13/0.20/25
Workstation 5A	0.36	44	26/0.36/44	15/0.21/25
Workstation 5A w/ Protege	0.44	52	31/0.44/52	N/A
Keyboard Workstation 4	0.22	26	N/A	N/A
Keyboard Workstation 270 /w No Battery	0.11	13	N/A	N/A
Keyboard Workstation 270 /w Battery Charging.	0.50	61	N/A	N/A
Keyboard Workstation 270 /w Battery Fully Charged.	0.11	13	N/A	N/A
PC Workstation 2010	0.47	55	38/0.39/48	28/0.3/34
PC Workstation 2010 /w TM-T88	0.53	94	N/A	N/A
PC Workstation 2015	0.55	67	45/0.55/67	18/0.25/30
PC Workstation 2015 with Protege	0.61	77	49/0.61/77	N/A
mStation/mTablet /w with optional mStation Battery, Printer, Scanner.	0.31	36	N/A	N/A

mTablet Multi-Bay Charger (Charging Eight mTablets)	1.2A (max)	144	N/A	N/A
Order Confirmation Controller				
OCC Base Unit	0.17	20	N/A	N/A

Device	Amp (A)	VA (VA)	Backlight ON (W)/(A)/(VA)	Backlight Off (W)/(A)/(VA)
OCC Pedestal - Normal (Daytime, Bright Sunlight)	0.54	65	N/A	N/A
OCC Pedestal - Winter (Cold Environment - Heater On)	1.36	164	N/A	N/A
OCC Pedestal - Summer (Warm/Hot Environment - Fans On)	0.99	119	N/A	N/A
Printers				
Epson TM-T88I,II,III, IV, V	0.25	30	N/A	N/A
Epson U200 Dot Matrix Printer	0.10	12	N/A	N/A
Epson TM-U230	0.35	42	N/A	N/A
Epson TM-U220	0.25	30	N/A	N/A
Epson U950 Combination Printer	0.25	30	N/A	N/A
RDC, NetCC, and LCD Monitors				
Restaurant Display Controller (RDC)	0.10	12	N/A	N/A
MICROS NetCC	0.50	60	N/A	N/A
e7 Back Office Controller or Digital Menu and Marketing Board Controller.	0.48	57	N/A	N/A
Typical 17” LCD Monitor	0.30	34	N/A	N/A
Typical 46” LCD Monitor	1.71	196	N/A	N/A
HP Servers/Personal Computers				
HP DL380 Gen 8	1.76	203	N/A	N/A
HP ML350 Gen 8	1.35	154	N/A	N/A
HP RP5800	0.33	40	N/A	N/A

4 Cable Requirements

This chapter describes the Ethernet and IDN cable requirements for MICROS workstations, printers and remote display systems.

Introduction

This chapter describes how to plan and install the various cabling systems found in a typical 9700, 3700, e7 or Simphony site. The following topics are covered:

- Planning the Network introduces the concept of a structured cabling system, describes the various types of cables that may be employed, and provides MICROS recommendations and requirements for Ethernet and IDN cabling.
- Installing the Ethernet LAN describes how to run the cables and terminate them at the wall plate.
- Installing an Integrated Device Network describes the cabling options available for driving MICROS IDN printers, including the use of a structured cable system.
- Installing a Kitchen Display System describes the site requirements for implementing a KDS and includes the MICROS wired (MBB) and wireless (MWBB) bump bars.
- Installing the e7 Kitchen Video Monitor Controller describes the cable requirements for implementing a serial interface to the host workstation.
- Installing the Order Confirmation Controller describes the site preparation requirements for installing the curb-side Pedestal including the concrete slab and recommended conduit egress.
- The Recommended Cables section lists MICROS approved IDN cabling.

Planning the Network

For reliability and ease of troubleshooting, all current MICROS products use 100/1000 BaseT networking topology based on twisted pair cabling that should be installed and certified by a qualified network contractor.

The benefits of this cabling system are described below. Also included in this section is a brief introduction to a structured cabling system and how it may be used to support MICROS workstations and peripherals.

Reduced Cable Costs

The installation of cable costs far more than the cable itself. The widely touted appeal of 10/100/1000 BaseT is that is gives one the option of using existing telephone wiring, thus saving installation costs. However, most sites do not have enough existing high-quality twisted pair cable available to support a network installation, so more cable has to be pulled anyway. The use of existing telephone wiring requires MICROS approval.

Management, Fault Isolation, and Security

Problems are easier to isolate. With the Ethernet star topology problems are easy to troubleshoot. A single workstation, printer, or server, is connected to a single port on the hub, switch or router, allowing the behavior each of connection to be individually monitored. LED indicators on each port provide immediate feedback on the link integrity

and speed. A failure can be isolated quickly, and the remaining Ethernet devices continue to operate while the problem is being addressed.

Adding or moving devices is as simple as installing a wall plate or plugging into a pre-wired connection at the switch or patch panel.

Even in small to or low-cost installations, the single point of concentration, point-to-point connectivity, and link status LEDs make diagnosing a problem on a 100/1000 BaseT network much easier than checking an entire length of coax cable for a break.

Structured Cabling Systems

When planning your network, MICROS recommends the Commercial Building Telecommunications Cabling Standard TIA/EIA-568-C.

TIA/EIA-568-C defines standards for the implementation of structured cabling systems for commercial buildings, and between buildings in a campus environments. It is composed of four sections.

The primary standard, TIA/EIA-568-C.1 defines the general requirements such as cable types, distances, cable termination, and certification methods. -568-C.2 focuses on twisted-pair cabling systems, -568-C.3 covers fiber optic cable systems, and -568-C.4, addresses coaxial cabling components.

The complete specification and related documents are published by Global Engineering Documents. The web address is global.ihs.com.

If a customer requests a structured cabling system other than ANSI/TIA/ EIA-568-C, a disclaimer should be drawn up absolving MICROS of responsibility for data cable related problems.

Elements of a Structured Cabling System

A structured cabling system divides premise wiring into five basic elements. Four of these elements are shown in Figure 32. Each component, including the fifth, Network Administration, is discussed in the following paragraphs.

Work Area

The work area encompasses all components between the faceplate and Ethernet based device. This includes the patch cable between the faceplate and Ethernet device. Each work area should be served by a telecommunications closet or wiring closet on the same floor.

Horizontal Cabling

This section consists of the cabling between the work area and the telecommunications closet. This includes the faceplates in the work area, the cable run to the faceplates or patch panel in the wiring closet.

Horizontal cabling can use UTP or STP cables and connection hardware. Termination of horizontal cables at the wall plate and patch panel can be achieved using a 110 connect system.

The maximum distance for any horizontal cable run is 90 meters (295 ft.) independent of the cable type. 90 meters allows an additional 10 meters (33 ft.) for patch cables in the work area and wiring closet.

Computer Room or Telecommunications Closet

All buildings should include at least one telecommunications or wiring closet. This space contains the hardware required to connect the horizontal cable runs from each work area

to the patch panels and hubs (using termination hardware like the 110 connect system). Patch panels are key elements of any structured cable system. Moves and changes are performed by simply moving a modular patch cord on the patch panel. Other devices on the network are unaffected by a change to an individual connection at the patch panel.

Appropriate cable routing and dressing fixtures should be used in the wiring closet to eliminate stress caused by tension, in addition to effectively managing and organizing all cables.

Backbone Cabling

Backbone cabling is the structured cabling element that provides interconnections between multiple wiring closets. However, in a small system that can be served by an 8, 12, or 16 port switch/router, a backbone cable may not be required unless the POS LAN is to become part of an existing on-site network or requires internet access.

Fiber is the recommended solution when distances between wiring closets is greater than 100 meters.

Network Administration

While not shown in the illustration, it is as important as any other element of the system. Network Administration encompasses system documentation, security, and backing up user data.

System Documentation

Even the smallest systems must be documented to allow for additions, troubleshooting, and equipment moves. Documentation includes producing a physical plan of the system including the location of each device and the wiring between each.

Password protection schemes should be implemented on each workstation to prevent unauthorized use of the application software or at least at the server to prevent unauthorized access to critical data files. A procedure needs to be implemented whereby unique user passwords are created and stored in a central, secured location.

Procedures should also be developed to change passwords at regular intervals and to remove the passwords for users who no longer have access to the network.

Backups

Roofs leak, pipes burst, hard disks fail, lightning strikes, and sometimes it even strikes twice. Data and application files can be lost or corrupted from any number of sources. Backing up system data and totals on a regular basis and storing them in a safe and secure place is a critical part of Network Administration, and will speed the recovery process in the event something does go wrong.

A procedure needs to be developed that defines when server backups will occur, how often they are performed, and how often backup tapes should be rotated and stored. Backup tapes stored on-site are useless if the building is flooded or burns down. Keeping a second set of backup tapes at the system administrator's home, for example, is a worthwhile precaution.

Structured Cabling Examples

Two examples are provided. Figure 32 shows MICROS workstations and peripherals integrated into a structured cabling system. Figure 33 is an example of a Simphony single workstation and printer installation.

Kitchen Display System

The KDS Controller requires a Category 6 or better faceplate and patch cable. If the 7 KVM Controller will use Ethernet, a Category 6 or better faceplate and patch cable are required. In addition to the KDS or e7 KVM, all LCD Monitors should be connected to dedicated, isolated ground AC outlets installed in accordance with the procedures outlined in Chapter 3.

Wireless Access Points

Wireless Access Point(s) should be installed only after a site survey is performed by a qualified wireless professional as outlined in PMA06-846 Revised.

Wireless Access Point(s) should be also be connected to a dedicated, isolated ground AC outlet installed in accordance with the procedures outlined in Chapter 3.

MICROS Workstations

Each MICROS Desktop Workstation or mStation location requires a Category 6 faceplate and patch cable. Each MICROS workstation requires a dedicated, isolated ground AC outlet installed in accordance with the procedures outlined in Chapter 3.

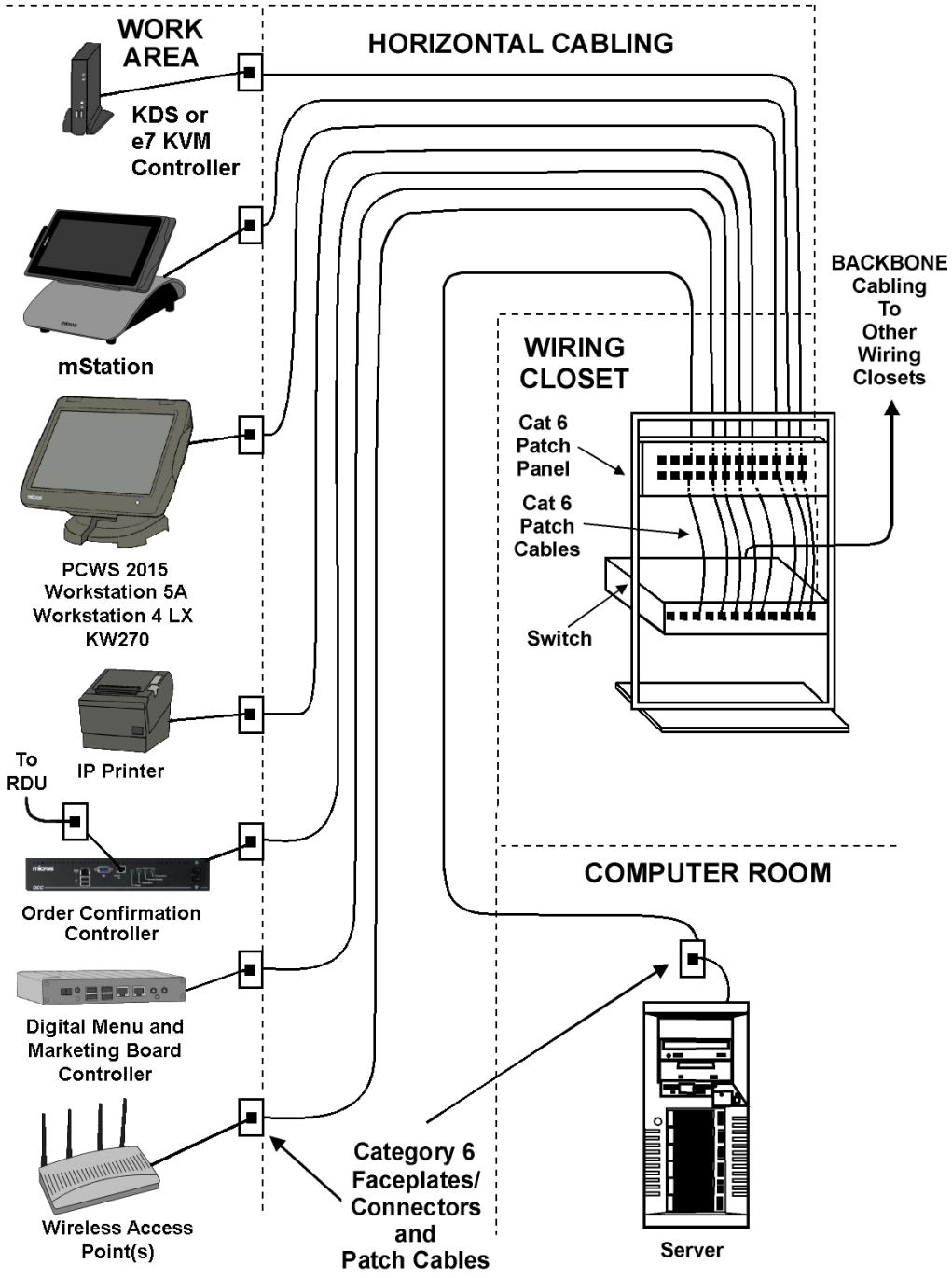


Figure 32 – Typical MICROS Equipment in a Structured Cabling System

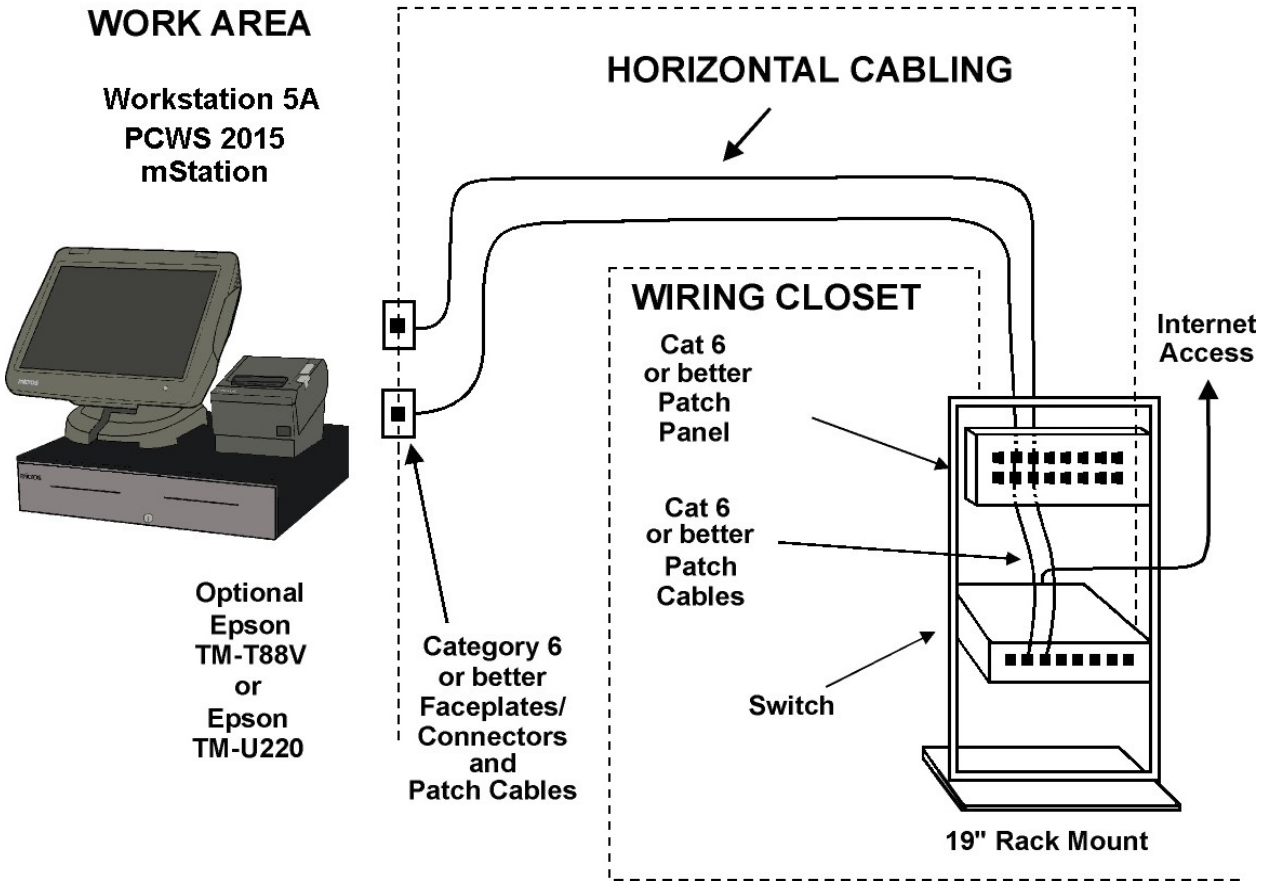


Figure 33 – Single Workstation and Printer Installation for Simphony

IP Printers

The IP Printer can be any supported Epson model equipped with Ethernet Module. Each printer requires one Ethernet channel as well as a dedicated, isolated ground AC outlet installed in accordance with the procedures outlined in Chapter 3.

Order Confirmation Controller

The Order Confirmation Controller requires a Category 6 faceplate and patch cable to connect to the POS application, but also requires a second Category 5e or better faceplate and patch cable as well as a Category 5e or better cable run to the Remote Display Unit housed in the pedestal.

For more information about the physical installation of the Pedestal information about installing the Order Confirmation System Pedestal, see the *Order Confirmation System* section.

Digital Menu and Marketing Board Controller

Each Digital Menu Board Controller in a system requires a Category 6 or better Ethernet faceplate and patch cable. Each Digital Menu Board Controller(s) and each LCD monitor requires a dedicated, isolated ground AC outlet installed in accordance with the procedures outlined in Chapter 3.

NetCC for 9700

The NetCC requires a Category 6 or better faceplate and patch cable. See *IDN Example #1* or *IDN Example #3* in Chapter 4 to connect the NetCC to IDN devices.

The NetCC requires the Preferred AC Power System. See Chapter 3.

e7 KVM Controller

If the KVM Controller Ethernet port is used, Category 6 or better Face Plate and Patch Cable should be placed near the unit and host workstation. See Chapter 4.

The KVM Controller, Monitors, and optional printer require the Preferred AC Power System detailed in Chapter 3.

Cable Types

The following data cable types are found in a typical installation.

Ethernet Cabling

In the electrically active environments that MICROS hardware typically operates, we strongly recommend shielded Ethernet cabling and connection hardware.

In electrically quiet environments, a certified UTP Category 6 or better cabling system and connection hardware is acceptable and does not void the hardware warranty. However, issues related to non-shielded cable may be subject to out-of-scope billing charges.

IDN Cabling

For IDN cabling, shielded cable or non-shielded cable installed in a separate grounded ferrous metal conduit is required.

Mechanical and Electrical Considerations for Cable Installation U

TP Cable Installed in Metal Conduit

If you want to install UTP cabling in a grounded metal conduit, consider the following:

- The conduit must be composed of ferrous metal, aluminum conduit is unacceptable as it provides little or no protection from EMI.
- The use of conduit must be continuous throughout the system from junction box to junction box to ensure an adequate ground return path.

PVC Conduit

PVC Conduit can be employed when cables must be buried below the floor level. When using PVC conduit in concrete flooring, the following guidelines apply:

- The PVC conduit should be located at least six inches below the surface of the floor.
- The PVC conduit should be located at least six inches from other nearby conduits.

Cable Damage

The possibility of mechanical damage to cables is generally apparent at the time of installation. This includes outdoor runs of cable, as sunlight, rain and mechanical flexing due to wind will cause the cable to deteriorate. The cable must not be kinked or bent too tightly, the bend radius should be at least four times the outside cable diameter.

Lightning

Lightning does not need to directly strike the cabling to cause damage or disruption to the system. Nearby lightning strikes produce strong electromagnetic fields which can induce voltages on the data transmission cables causing disruptions or damage.

A grounded ferrous metal conduit should be employed for installations in geographical areas subject to frequent thunderstorm activity. In cases where shielded cables are used, the effects of lightning can be reduced by placing the cable runs as close to ground level as possible.

Electrical Motors

Motors of various sizes are found in a typical restaurant or hotel site. A grounded ferrous metal conduit should be employed when cabling must be run at distances less than two feet from motors that are 1/4 horsepower or smaller, or less than six feet from motors larger than 1/4 horsepower.

Radio Frequency Interference (RFI)

The probability of RFI varies in accordance with many factors, including transmitter power, location, construction materials used in the building, and the physical placement of the power and data transmission cables.

Cable Categories

Ethernet cabling is placed into categories that define the quality of both the cable as well as related connection hardware such as faceplates, modular connectors and patch cables.

Several categories of UTP and related connection hardware are defined for a structured cabling system. Several cable suppliers now offer the STP equivalent of Category 6 cables and connection hardware. Each category is briefly defined below.

Category 5e

The Category 5e standard was formally defined in 2001.

Category 5e represents an incremental improvement over Category 5 with tighter specifications designed to support full-duplex Fast Ethernet and Gigabit Ethernet. Most current MICROS terminals support Gigabit Ethernet.

Category 5e cable performance characteristics and certification methods are defined in ANSI/TIA/EIA-568-B.2-2001.

Category 6

Category 6, ratified in June 2002 (ANSI/TIA/EIA-568-B.2-1), provides higher performance than Category 5e with more stringent specifications for crosstalk and system noise in addition to supporting a bandwidth up to 250Mhz. Category 6 cable is standardized for Gigabit Ethernet, a port included on all current MICROS workstations.

Category 6a cable, or Augmented Category 6, was defined in February 2009 in ANSI/TIA-568-C.1 and is characterized to operate at 500 MHz with improved alien crosstalk characteristics.

Category 6 or 6a cables and connection hardware must be properly installed and terminated to meet specifications.

In sites with a high amount of electromagnetic interference (EMI) shielded cable may be required. The shielding reduces the effect of EMI on data carried by the cable. Shielding must be maintained from one cable end to another using a drain wire in the same sheath as the twisted pairs.

Installing the Ethernet Network

The following paragraphs describe the recommended cable lengths, and how to terminate the cables at each face plate/wall jack.

Topology

A twisted-pair Ethernet LAN is based on the distributed star or tree wiring topology where the network switch or router is the central element.

Cable Runs

Before cable is pulled, the physical location of all devices must be determined including workstations, servers, wireless access points, IP Printers, RDU, and OCC. The equipment location should be specified on the floor plan, or riser diagram of the property.

Workstations, IP Printers, NetCC, KDS Controller and OCC

All horizontal cable runs from the patch panel/switch/router(s) to individual work area faceplates should be at least 3 meters (10 feet) to no more than 90 meters (295 feet). The 3 meter minimum allows collisions to be more easily detected.

Limiting the cable run to 90 meters reserves 10 meters (33 ft.) for patch cables at the patch panel and the device.

Faceplates, modular connectors, patch panels and patch cords must be the same category as the selected cable. In other words, when you pull Category 6 cable, all other components must be rated for Category 6 as well. In addition, if you are installing shielded cable, all other components including the patch panel must provide a location to terminate the ground wire.

Refer to Figure 35 and Figure 36 to terminate all Ethernet and VGA over twisted pair cables.

LAN Cable Termination

Several methods are available for terminating the horizontal cable runs. MICROS recommends the 110 Connect system by AMP or other suppliers. This system uses the reliable 110 style punch-down RJ45 modular jack and are available in both shielded and non-shielded versions.

A second termination method is based on the 8-pin RJ45 modular “keystone” insulation displacement connector, similar to those available for MICROS IDN devices. The cable is attached to this connector by placing all conductors in the appropriate connector cap, and forcing the connector cap into place.

The figure below shows a “keystone” modular jack on the left and a 110 modular connector on the right.

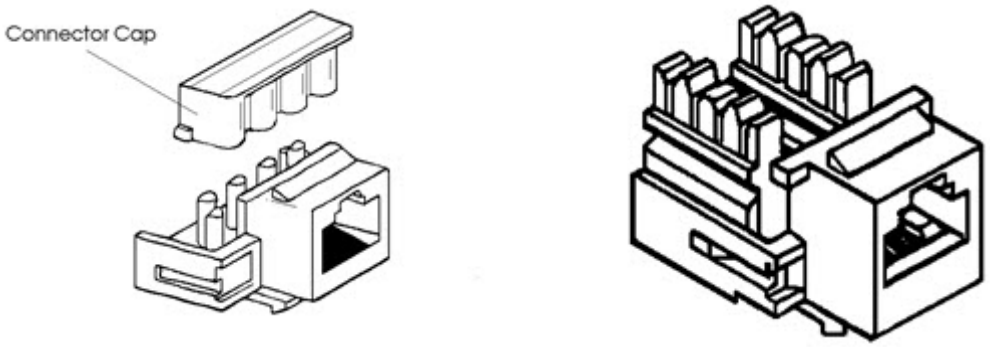


Figure 34 – 8-Pin "Keystone" (left) and 110 Connect (right) RJ45 Modular Jack

In addition two methods of terminating the cable may be used. The figures below show how to terminate cables at the faceplate connectors using the ANSI/TIA/EIA-568-A or ANSI/TIA/EIA- 568-B cabling standard.

ANSI/TIA/EIA-568-B.1-2001 specifies that horizontal cables should be terminated using the T568A pin/pair assignments, or optionally terminated with the T568B pin pairs to accommodate certain cabling systems. Mixing T568A terminated horizontal cables with T568B terminated patch cords (or the reverse) is not recommended.

Please note that pins 1-2, 3-6, 4-5, and 7-8 are +/- signal pairs twisted with each other within the cable. You must maintain these signal pairs at each end of the cable as well as the patch cables.

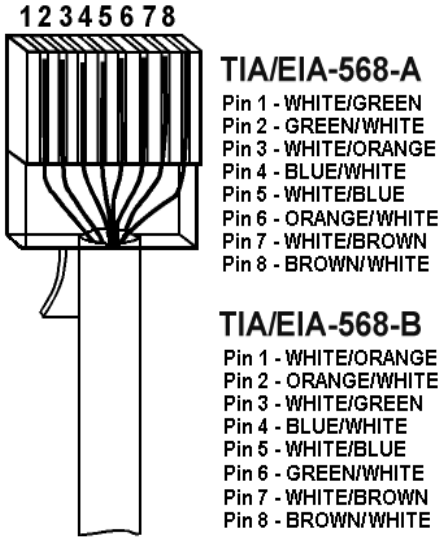


Figure 35 – Cable Termination

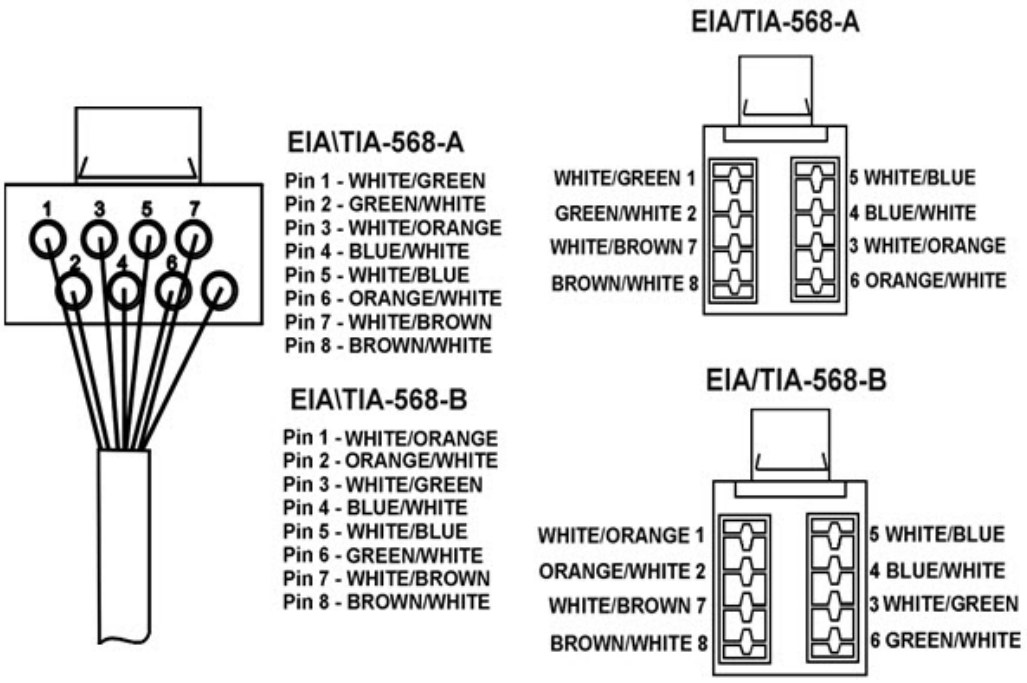


Figure 36 – Keystone Modular (left) or 110 Connect Modular (right)

Extending Ethernet Beyond the 90 Meter Limit with Fiber Optic Cable

Fiber optic cables have conductors made of glass, rather than metal. A typical fiber cable is composed of a glass core which carries the light signals. The core is encased in cladding which keeps the light contained in the core.

No electrical impulses are carried over a fiber optic cable as in a metal cable. Instead, the electrical impulses are converted to pulses of light that indicate whether a bit is 1 or a 0.

Signals on metal cables and the light in a fiber optic cable travel at approximately the same speed, but light meets less resistance as it travels along the cable. Therefore light signals go further with less attenuation. Fiber optic links on simple LANs can run without a repeater to distances of more than 3.5 kilometers.

Fiber based cabling systems are more reliable than metallic cabling systems because they are immune to electrical noise generated by support equipment in the building. Despite shielding, grounding, and bypassing, metallic cables can behave like antennas, making them susceptible to RF noise. The greater the length of the cable, the greater the possibility it will be subject to interference from nearby electrical equipment.

In addition, metallic cables can be subject to an effect that produces voltage potentials between the cable and electrical ground. This can occur in large buildings or campus environments where equipment is powered from multiple AC power panels that are not operating at the same AC ground potential.

At the very least, the voltage potential can skew the data signals on the cable, causing transient disruptions and or occasional losses of data. If the voltages are great enough, arching between cable segments and smoked network interface components are possible. Fiber optic cable is immune to these phenomena.

Fiber is recommended for distances greater than 100 meters or as a solution to ground potential issues. A number of cost effective media converters conforming to this standard are available. Many use fiber connectors which are easy to terminate.

The recommend media converter from Transition Networks (as well as other suppliers) use ST type fiber connectors that are easier to terminate than other types of fiber connectors. In addition prefabricated fiber cables of various lengths pre-terminated with ST connectors are available.

Recommended Fiber Based Media Converters

One of the most efficient ways of extending a 100Mbps cable segment beyond the 90 meter limit is with a pair of media converters. These devices allow you to insert a fiber cable between two copper cable segments to extend the total distance between two Ethernet devices.

In a structured cabling system, individual cable runs are limited to 90 meters (100 meters minus 10 meters for patch cables at each end), or 295ft. However, running an Ethernet cable beyond this distance is often a requirement for large sites. In addition, a media converter can also be used to isolate clusters of MICROS equipment if a site is experiencing AC ground potential issues.

Media converters are available that can increase the distance between any two Ethernet devices up to 2000 meters, (6,600ft) using multi-mode fiber, or up to 20000 meters (66,000ft) using single mode fiber without a repeater.

MICROS recommends Transition Networks copper to fiber media converters. These devices can extended a cable segment up to 2000 meters, more than adequate for most situations.

Other features include power, data, and link status indicators. More information can be found at www.transition.com.

Installing an Integrated Device Network (IDN)

The following section describes how to install a network of MICROS Integrated Device Network (IDN) printing devices supported by all MICROS application software.

In most cases, IDN printer(s) are driven by the RS422-A/RS422-B or IDN port of a Workstation. One exception is the NetCC2, supported only by the 9700 application.

Two methods can be used to connect IDN devices.

- The first method makes use of what we call the 'traditional' MICROS IDN connection hardware, combined with MICROS approved in-wall RS422 cabling.
- The second method utilizes a custom MICROS IDN to Ethernet Patch Cable to build an IDN based on shielded cable and connection hardware. This cabling method can be installed and certified by cable contractors in the same manner as Ethernet cabling.

TIP: Ethernet Printer modules are available, and sometimes referred to as 'IP' printers. Printers equipped with Ethernet Modules are connected to the LAN like any other Ethernet Device, requiring a Category 6 or better faceplate and patch cable.

IDN and Serial Modules and connection hardware continue to be available.

Traditional MICROS RS422 Cabling and Connection Hardware

This section introduces the 'traditional' MICROS IDN connection hardware and Part Numbers. Take a moment to examine Figure 38. It is an example of using the traditional IDN cabling and connection hardware to drive IDN printers from any MICROS Workstation or the 9700 NetCC2.

Wall Plate

This wall plate mounts to a standard 4x4 metal or plastic conduit box with a plaster ring purchased by the installer. Four screws are provided to mount the plate to the box. To install modular connectors, you must first remove a plastic "knock-out," then snap the connector into place.

6-Pin Modular Connector

This six-pin keystone style modular connector terminates the in-wall wiring at each IDN device in the system. Included in the same package is the "connector cap." Cable termination is completed by inserting the conductors and the shield or drain wire into the cap and forcing the cap onto the pins of the connector.

Patch Cables

An 8-Pin to 6-Pin IDN Patch Cable is included with each IDN printing device. This cable connects the device to the 6-pin modular connector on the wall plate.

All IDN printer modules include a pair of 6-pin connectors, wired in parallel to allow them to be daisy chained to another printer.

IDN Connectors

This section describes ports that are used to drive MICROS IDN Printers.

MICROS Workstations

All current MICROS workstations include at least one port capable of driving IDN printers.

The MICROS PCWS 2010, 2015, Workstation 5/5A include an 8-pin port designated as 'COM4/IDN' to drive IDN devices. The Workstation 4 LX and KW270 include two ports, designated 'RS422- A' and 'RS422-B' each is capable of driving IDN devices.

NetCC2 (9700)

For 9700 only, the NetCC2 contains eight ports capable of driving single IDN printers or IDN Printer Networks.

Running the Cable

IDN cable runs are installed in a multi-drop or daisy chain configuration to each device to form a network. Refer to Figure 38. A MICROS approved RS422 cable is started at the wall plate near the workstation and is daisy chained to a wall plate near the first printer and so forth until all printers are connected.

The absolute maximum length of an IDN cable run is 2500 feet using shielded or non-shielded.

Terminating the IDN Cable

Refer to Figure 37 and terminate the IDN cable at each modular connector.

- Attach the printer to the wall plate with the 6-pin to 6-pin patch cable supplied with the device.

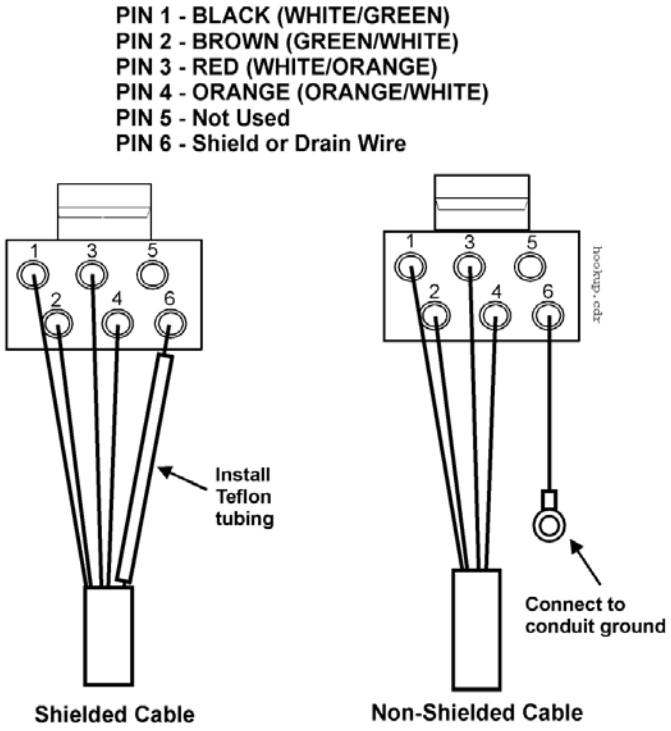


Figure 37 – IDN Cable Terminiation

- Strip the outer insulation off of the cable to expose about 1 inch of the conductors. Do not strip the insulated conductors.
- Place the color coded conductors and ground wire into the connector cap and press the cap into place. If this is a multi-drop connection, place two conductors of a like color into the connector cap and press the cap into place. Use a small pair of pliers to push the connector cap into place.
- If shielded cable is used, place the length of Teflon tubing over the drain wire to prevent it from shorting to the other conductors.
- If non-shielded cable is used, fasten the ring terminal on the ground wire to conduit ground.
- Repeat at each IDN connector.

IDN Example #1- Traditional IDN Cable/Connection Hardware

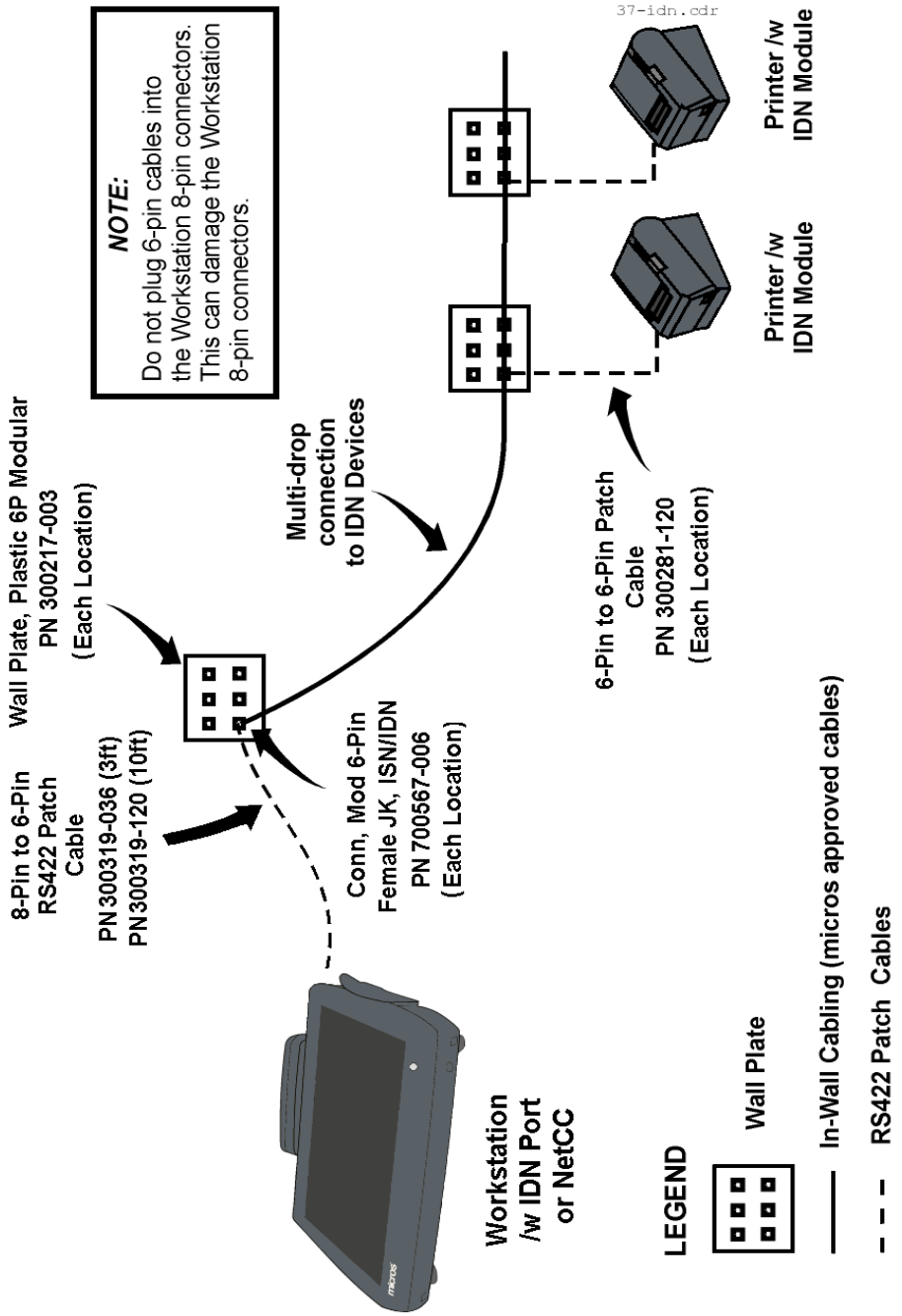

37-idn.cdr
NOTE:
Do not plug 6-pin cables into the Workstation 8-pin connectors. This can damage the Workstation 8-pin connectors.
Printer /w IDN Module
Printer /w IDN Module
Multi-drop connection to IDN Devices
6-Pin to 6-Pin Patch Cable PN 300281-120 (Each Location)
Wall Plate, Plastic 6P Modular PN 300217-003 (Each Location)
8-Pin to 6-Pin RS422 Patch Cable PN300319-036 (3ft) PN300319-120 (10ft)
Conn, Mod 6-Pin Female JK, ISN/IDN PN 700567-006 (Each Location)
Workstation /w IDN Port or NetCC
LEGEND
Wall Plate
In-Wall Cabling (micros approved cables)
RS422 Patch Cables

Figure 38 – Traditional IDN Cabling Example

Using Shielded Cable and Connection Hardware for IDN

MICROS IDN printers can be integrated into a more robust shielded structured cabling system by using a pair of custom MICROS patch cables. See Figure 39. These custom

patch cables, a 6-Pin to 8-Pin version and an 8-Pin to 8-Pin version, place the MICROS RS422 transmit/receive pairs on the ANSI/TIA/EIA-568-A compliant transmit/receive pairs.

Components

All versions are based on shielded twisted pair cabling and connection hardware, providing the highest level of immunity from EMI.

The heart of this system is a shielded patch panel and grounding hardware. Also required at each printer location are the MICROS IDN to Ethernet patch cables, shielded faceplates, modular connectors, and patch cables, all of the same cable category. The shielded modular connectors and patch panel connectors differ from their non-shielded counterparts by providing a method of terminating the drain wire.

IDN Connectors

This section describes ports that are used to drive MICROS IDN Printers.

MICROS Workstations (Example #2)

All MICROS Workstation contain at least one 8-pin modular port designated for driving IDN devices. The required patch cables are shown in Figure 39.

NetCC2 (Example #3)

The NetCC2 includes up to eight ports for driving IDN printers

Running and Terminating Cables, Example #2

In Figure 39, the workstation driving IDN printers is shown at the left of the illustration. One 8-Pin to 6-Pin IDN Patch cable (PN 300319-001) is connected between the 8-pin IDN port on the workstation to one of the 6- pin connectors on the local module.

Patch cable PN 300319-303 is installed between the remaining 6-pin connector on local IDN printer and the faceplate connector to convert the IDN transmit/receive pairs into ANSI/TIA/EIA-568-A compatible transmit/receive pairs.

Install a pair of Cat 6 or better shielded cables between the patch panel and the two connectors on the wall plate near each printer location. The ‘dual run’ to the faceplate is required to obtain cable certification since a daisy chain configuration is not part of Ethernet topology. Terminate the drain wire of each cable run at the patch panel.

To maintain the IDN daisy chain, install Category 6 or better patch cables at the patch panel. At each remote printer location, install a pair of 300319- 303 patch cables to maintain the daisy chain at the printers. The last printer in the chain requires only one patch cable.

Running and Terminating Cables, Example #3

In Figure 40, each NetCC2 IDN output includes the NetCC2 Patch cables, connected to LCC/RCC/NetCC2 to EIA/TIA/568-A Patch Cable PN 300319-302. These patch cables are run to the shielded patch panel.

The heart of the either system is a shielded Category 6 or better Patch Panel. Also required are shielded Category 6 or better faceplates, and modular connectors. The shielded modular connectors and patch panel connectors differ from their non-shielded counterparts by providing a method of terminating the shielded cable drain wire.

The IDN daisy change is created by running a patch cable from the NetCC2 output channel to the patch panel. Non-shielded patch cables are installed at the patch cable. A

pair of shielded cable runs are installed between the patch panel and faceplate at each printer location, and a pair of EIA/TIA-568-A patch cables are required at each printer location (with the exception of the last printer in the line) to maintain the daisy change.

IDN Example #2 - Workstation IDN Port /w Shielded Cables

The figure below is an example of driving a small network of IDN printers from any Workstation with an IDN port using shielded category 6 or better cable and connection hardware.

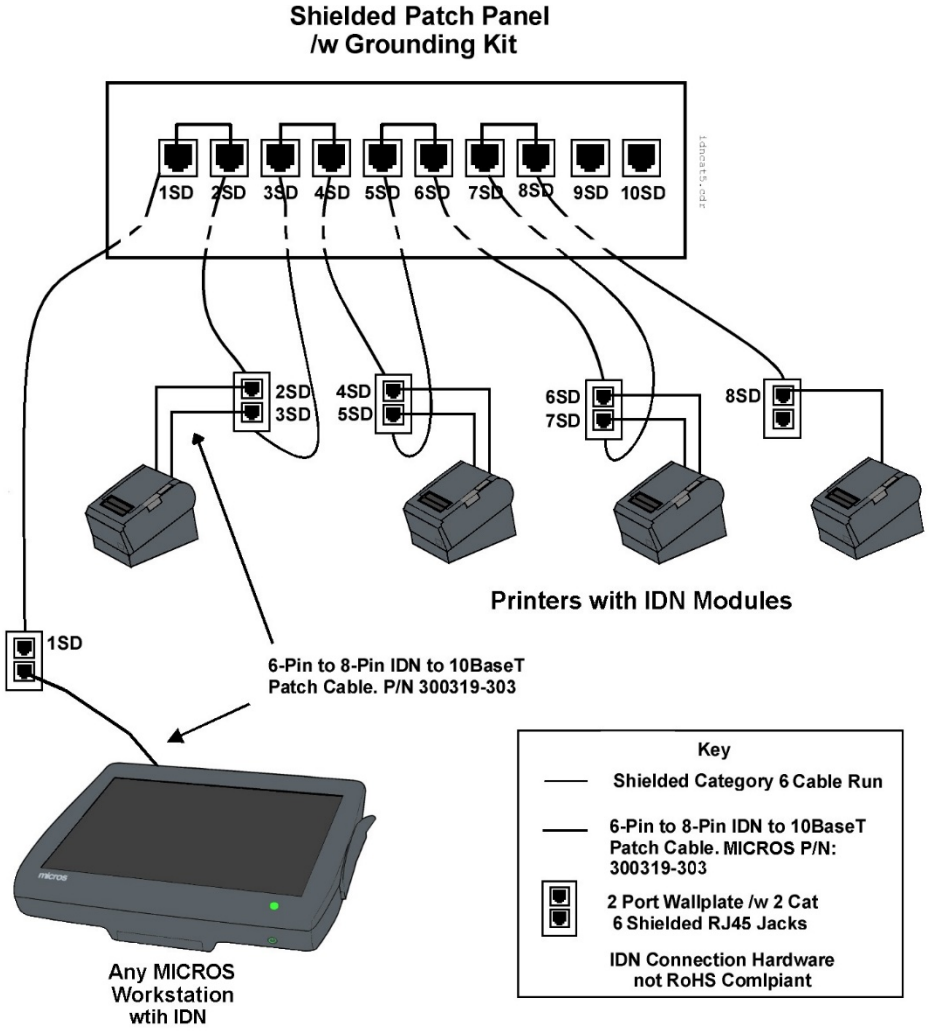


Figure 39 – MICROS Workstation Driving IDN Printers over Shielded Cabling

IDN Example #3 - NetCC IDN Ports /w Shielded Cables

The figure below shows example of using the 9700 NetCC to drive printers with IDN Modules using shielded cable and connection hardware. The NetCC is supplied with eight PN 500110-015 dongles, required to connect the NetCC to a MICROS Integrated Device Network (IDN).

The NetCC2 also requires a Category 6 or better wall plate or patch cable.

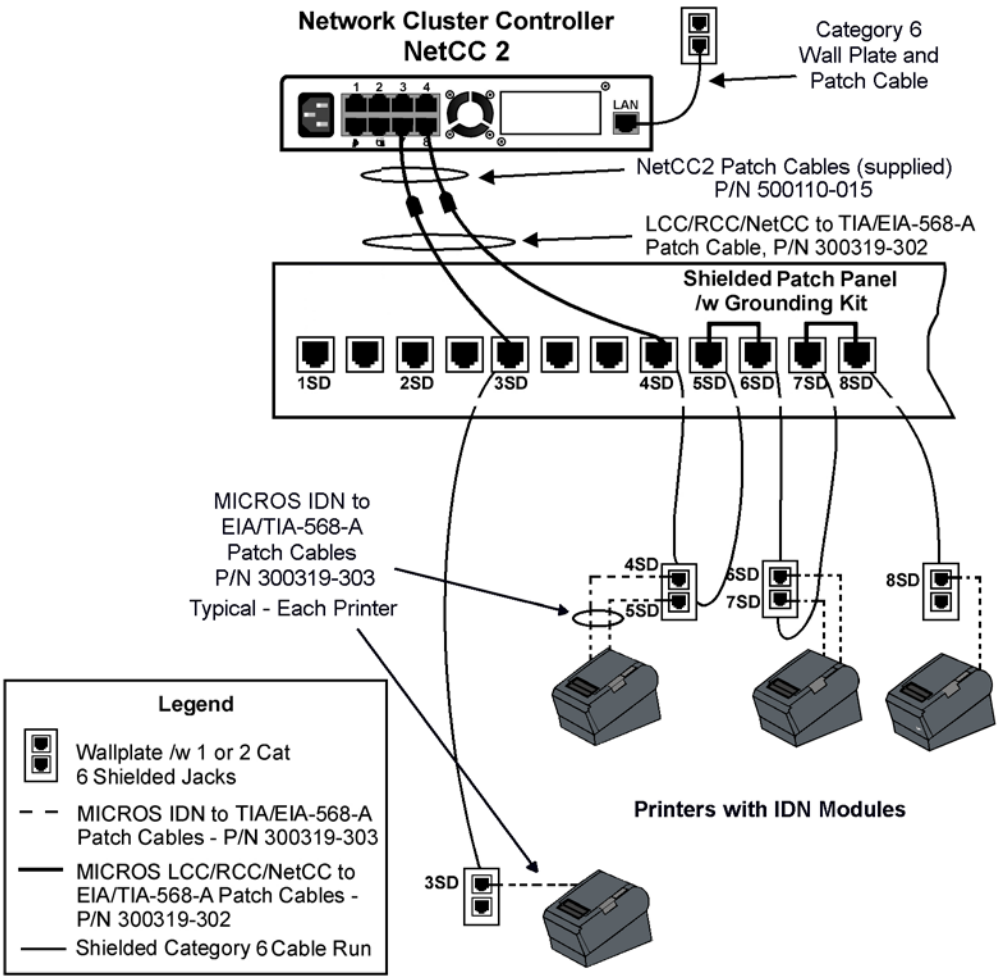


Figure 40 – MICROS NetCC2 Driving IDN Printers over Shielded Cabling

Kitchen Display System

The Kitchen Display System is composed of three components: The Ethernet based Restaurant Display Controller (RDC), LCD monitor and wired or wireless MICROS bump bars.

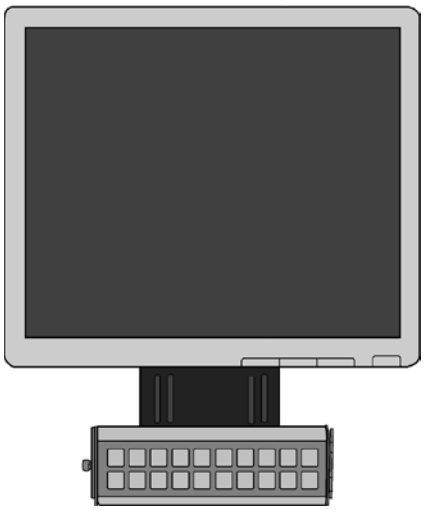


Figure 41 – Typical KDS Monitor Bumpbar and Mounting Bracket

KDS Mounting

A wide variety of LCD and Bumpbar mounting options are available, contact your MICROS representative if the LCD mounting options need to be determined.

KDS Controller

The KDS Controller requires a Cat 6 faceplate and patch cable near each location.

MICROS Wired Bump Bar Installation Considerations

MD0011-14 covers the Wired Bump Bar installation.

The MICROS Wired Bump Bar is supplied with a 6ft. (1.8M) cable. The 11 foot cable is also available with PN 700503-070.

MICROS Wireless Bump Bar Installation Considerations

Before installing the mounting brackets, consider the following site related issues to ensure the best possible functionality from the MWBB in an active RF environment.

Range

Distances of up to 30 feet are possible when the dongle and bump bar are within 'line-of-sight' of each other, with no obstructions in the path of the RF signals.

As the number and type of obstructions between the dongle and bump bar increase, the range decreases. See the Classification of RF Obstructions section below for more detail.

Classification of RF Obstructions

RF signals will encounter two types of obstructions that either weaken or reflect the signal, depending on its material composition.

The first type of obstruction is one that allows the signal to pass through, but attenuates, or weakens it. Some examples include walls constructed of wood, drywall, people, and concrete block. The amount of attenuation is proportional to the total thickness of materials that must be penetrated by the RF signal traveling the line-of-sight path.

The second type of obstruction is one that reflects the RF signals, allowing little or none to pass through. The reflected RF energy can cause interference even when the dongle and bump bar are located within line-of-sight. Any type of metallic substance falls into this category. This includes objects such as stainless steel food preparation areas, walk-in freezers, steel doors, and steel support beams.

Local RF Interference

The RF signals emitted by the MWBB are located in the unlicensed 2.40 - 2.50 GHz ISM band. Nearby occupants of this band include microwave ovens (2.485 GHz), 802.11 b/g Wi-Fi, cordless phones, IEEE 802.15.4 (WPAN), ZigBee, and other personal area networks. The MWBB should be located as far from these devices as possible.

The greater the distance between the dongle and the bump bar, plus the greater the number of obstructions between the two devices may allow extraneous RF devices to impact the operation of the wireless bump bar.

In cases where the site is too noisy in terms of RF interference, MICROS recommends the use of the MBB-10 and MBB-20 wired Bump Bars.

e7 Kitchen Video Monitor (KVM)

The Figure below describes how to implement a serial interface between the host Workstation and e7 KVM Controller.

The Null Modem Cable is required. PN 700503-006 is 10 feet in length. Cable pin-outs for the Null Modem Cable and RJ45 to DB9 adapters are provided in the installation document and Appendix B. This cable can be extended to at least 50 feet (15.24m) if required.

The USB to RS232 DB9 M/M (Male-to-Male), PN 700503-089 is also required for a serial interface. Note that the e7 KVM Controller includes a driver specific to this cable; similar USB to RS232 DB9 Adapter Cables from other suppliers may not function.

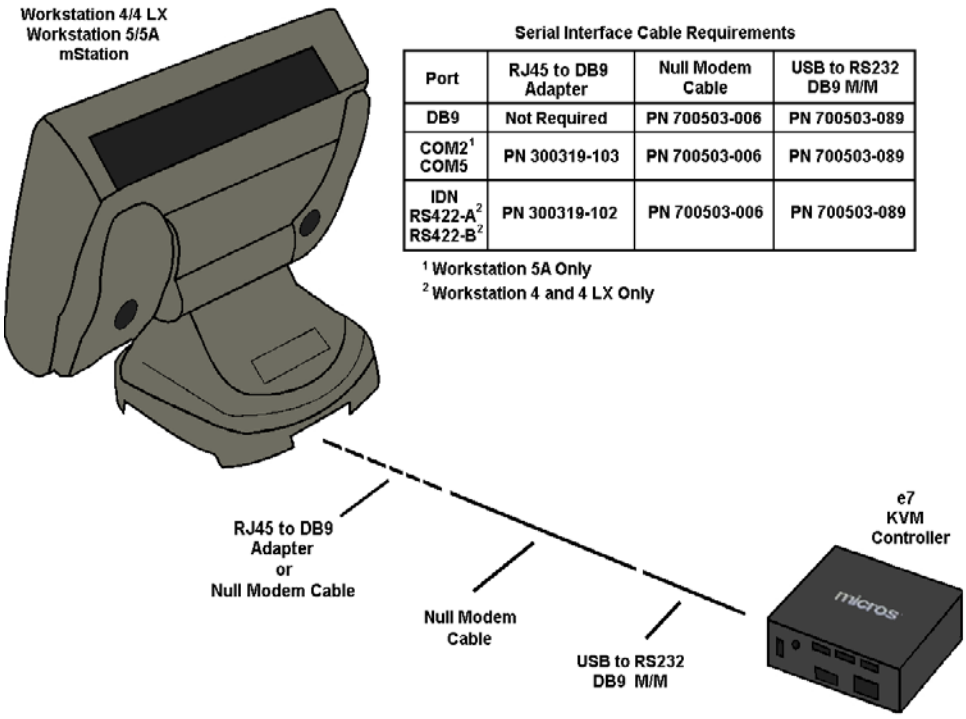


Figure 42 – Serial Interface to the e7 KVM Controller

Referring to the Cable Requirements table, the left column lists the available ports on the supported workstations. The type of port chosen determines if an adapter cable is required.

When using the DB9 port, the Null Modem cable connects directly to the workstation, so the RJ45 to DB9 Adapter is not required.

One DB9 port is available on the Workstation 4, 4 LX, 5, and 5A and two DB9 ports are available on mStation. If a DB9 port is not available, a modular RJ45 port can be used, but this requires an additional cable adapter, detailed next.

Using the COM2 or COM5 port requires RJ45 to DB9 adapter, PN 300319-103 in addition to the other cables.

COM2 and COM5 are RJ45 serial ports with full handshake capability. COM5 is located on the Workstation 5, 5A and mStation, while the Workstation 5A adds COM2.

Using the IDN or one of the RS422-A/RS422-B port requires RJ45 to DB9 adapter, PN 300319-102 in addition to the other cables.

One IDN port is available on the Workstation 5, 5A and mStation. Two ports, labelled RS422-A and RS422-B are available on the

Workstation 4 and 4 LX and are functionally equivalent to the IDN port.

Pin Diagrams for the Null Modem Cable, RJ45 to DB9 adapters, and workstation ports can be found in Appendix B.

Order Confirmation System

The Order Confirmation System is composed of an in-store Order Confirmation Controller (OCC), attached to a curb-side Remote Display Pedestal for drive-through applications. Please refer to Appendix A for detailed dimensions of the pedestal and base plate.

Order Confirmation Controller (OCC)

The Order Confirmation Controller requires a Category 6 or better cable run and face plate. The AC Power requirements are the same a MICROS workstation.

The OCC can be placed on a shelf or mounted to a wall with the included wall bracket. Appendix A includes dimensional drawings of the unit and wall mount bracket.

Remote Display Pedestal

Listed below are the site preparation requirements for the Remote Pedestal. Dimensional drawings for the Pedestal and pre-attached base plate can be found in Appendix A.

Concrete Slab

A 0.23″ (6mm) thick base plate is affixed to the pedestal to provide a stable platform. The base plate should be mounted to a 1/2″ thick concrete slab, roughly the same dimension as the base plate. Located at the center of the base plate is opening for conduit egress.

For new installations, a minimum of four studs (supplied by the installer) projecting from the slab as shown in the figure below.

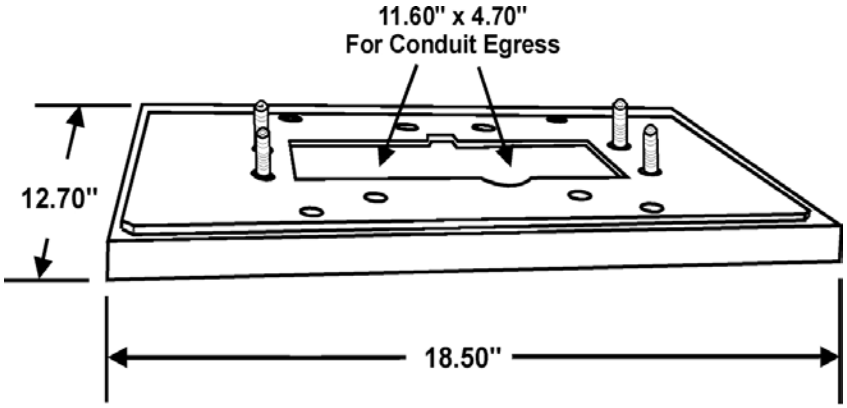


Figure 43 – Pedestal Slab Example

Conduit Runs

The pedestal requires three independent conduits, AC Power, Audio, and VGA over Cat 5e cable.

For new installations, MICROS recommends that three ferrous metal conduits as defined in Chapter 3 be run to the slab through the opening in the base plate.

Alternately, the conduits can enter the pedestal from outside the enclosure. The figure below displays the locations of the 1″ OD conduit punch-outs, on the front, back, and sides of the pedestal.

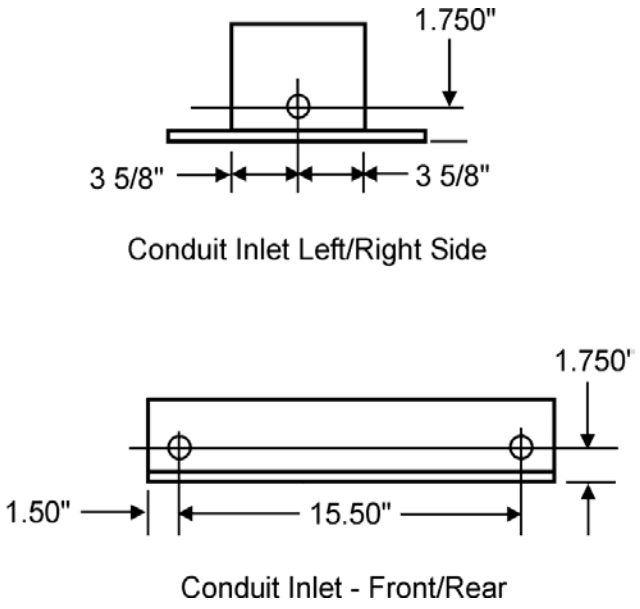


Figure 44 – Pedestal Alternate Conduit Entry Dimensions

Conduit - AC Power

The AC line should be installed in accordance with the Preferred AC Power System as defined in Chapter 3.

Conduit - Audio

The Audio Conduit is reserved car detection and audio between the pedestal and store. The in-store audio system is currently installed by third parties. The Pedestal provides industry standard mounting locations for the speaker and microphone.

Conduit - VGA Over Category 5e Cable

One conduit should be dedicated to the Category 5e or better cable run from the in-store OCC. Therefore a minimum of Category 5e cable run is required between the OCC to the Remote Pedestal location. This cable should be installed, terminated and certified in the same manner as any Cat 5e cable run.

Pedestal AC Outlet

An AC outlet is required within the pedestal housing. The figure below shows the area available in the Pedestal that can be used to mount the outlet box. Local electrical codes may require a Ground Fault Interrupter (GFI) outlet to be mounted at least two feet above ground level in areas prone to flooding.

The preferred method is to mount the outlet box directly to conduit, positioned at a height above ground level that meets local electrical codes.

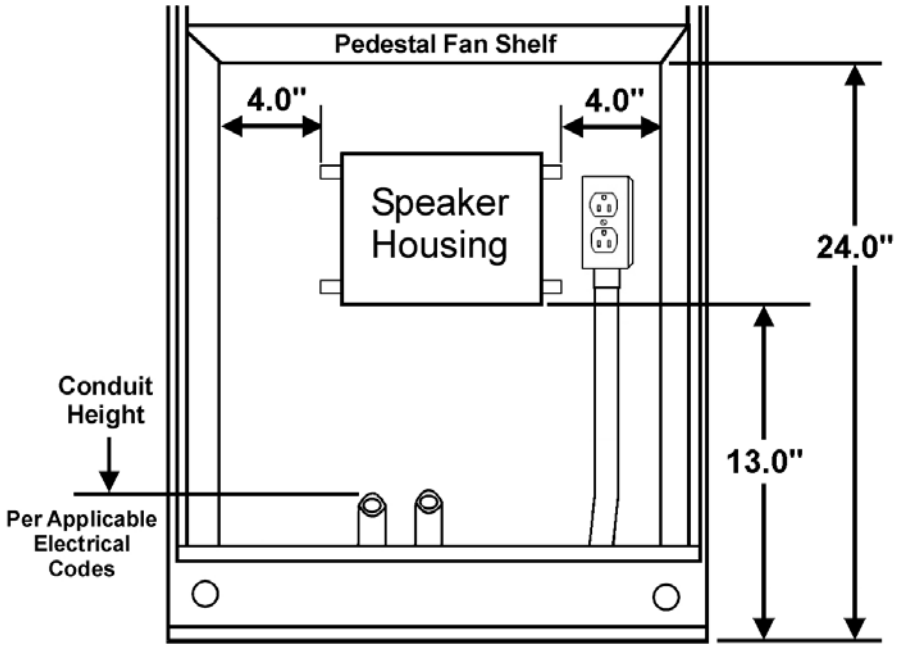


Figure 45 – Pedestal AC Outlet - Recommended AC Outlet Location

Recommended Cables

Approved Cable for MICROS RS422 IDN Networks

The table below lists specifications for the RS422 cabling used for IDN printing devices. However the cable must be shielded appropriately for those sites not using metal conduit. Instead of this cable, it is acceptable to use shielded Category 6 or better cable.

The sections that follow list acceptable equivalent cables to the cable supplied by MICROS under the part number listed below.

Table 28 - RS422 Cable Specifications

Specification	Details
MICROS PN	700506-004
Number of Pairs	2
Conductor Colors	Black/Brown, Red/Orange
Conductors	7/32 Stranded tinned copper 24 AWG
Shield	Overall Foil/Braid 100% Shield, 90% Braid 28 AWG Stranded tinned copper drain wire
Insulation	Conductor: Polyethylene Jacket - PVC
Jacket Outside Diameter	No less than .280″ to no greater than .320″
Working Voltage	30 V Minimum

Characteristic Impedance	100Ω
Must be Recognized	UL 2919
Marking	As required by UL

MICROS approved IDN/RS422 are listed below.

Approved Cable Equivalents Shielded Cable with PVC Insulation

- MICROS PN 700506-004
- Belden 9829
- Olympic 3929
- Manhattan 3980
- Carol C0829

Shielded Cable with Teflon Insulation

- MICROS PN 700506-104
- Belden 89855
- Berk Tek 256133
- Olympic 6173T

Non-Shielded Cable with PVC Insulation

- Belden 8444
- Olympic 2998
- All CAT6 or better UTP or STP cable that meets the ANSI/EIA/TIA- 568-A/B specifications and has a PVC jacket.

Non-Shielded Cable with Teflon Insulation

- Belden 89729, 88444
- Olympic 2998T
- All CAT6 or better UTP or STP cable that meets the ANSI/EIA/TIA- 568-A/B specifications and has a Teflon jacket.

Appendix A: Equipment Dimensions

This appendix includes dimensional drawings for MICROS Workstations and peripheral equipment.

PC Workstation 2015 - Low Profile

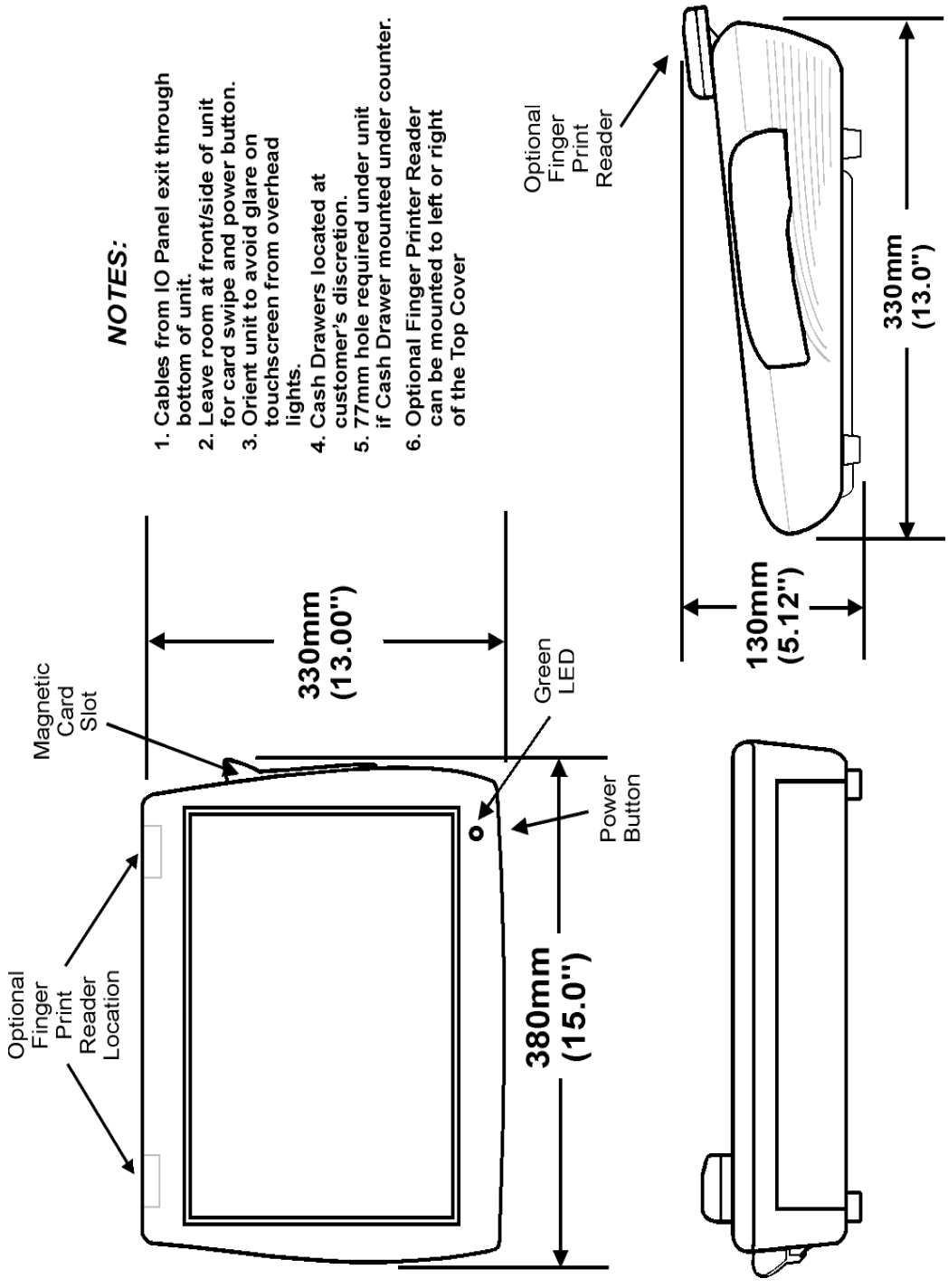

NOTES:
1. Cables from IO Panel exit through bottom of unit.
2. Leave room at front/side of unit for card swipe and power button.
3. Orient unit to avoid glare on touchscreen from overhead lights.
4. Cash Drawers located at customer's discretion.
5. 77mm hole required under unit if Cash Drawer mounted under counter.
6. Optional Finger Printer Reader can be mounted to left or right of the Top Cover
Optional Finger Print Reader
330mm (13.0")
130mm (5.12")
Magnetic Card Slot
330mm (13.00")
Green LED
Power Button
Optional Finger Print Reader Location
380mm (15.0")

Figure 46 – PC Workstation 2015 - Low Profile

PC Workstation 2015 - Low Profile with Customer Facing Display

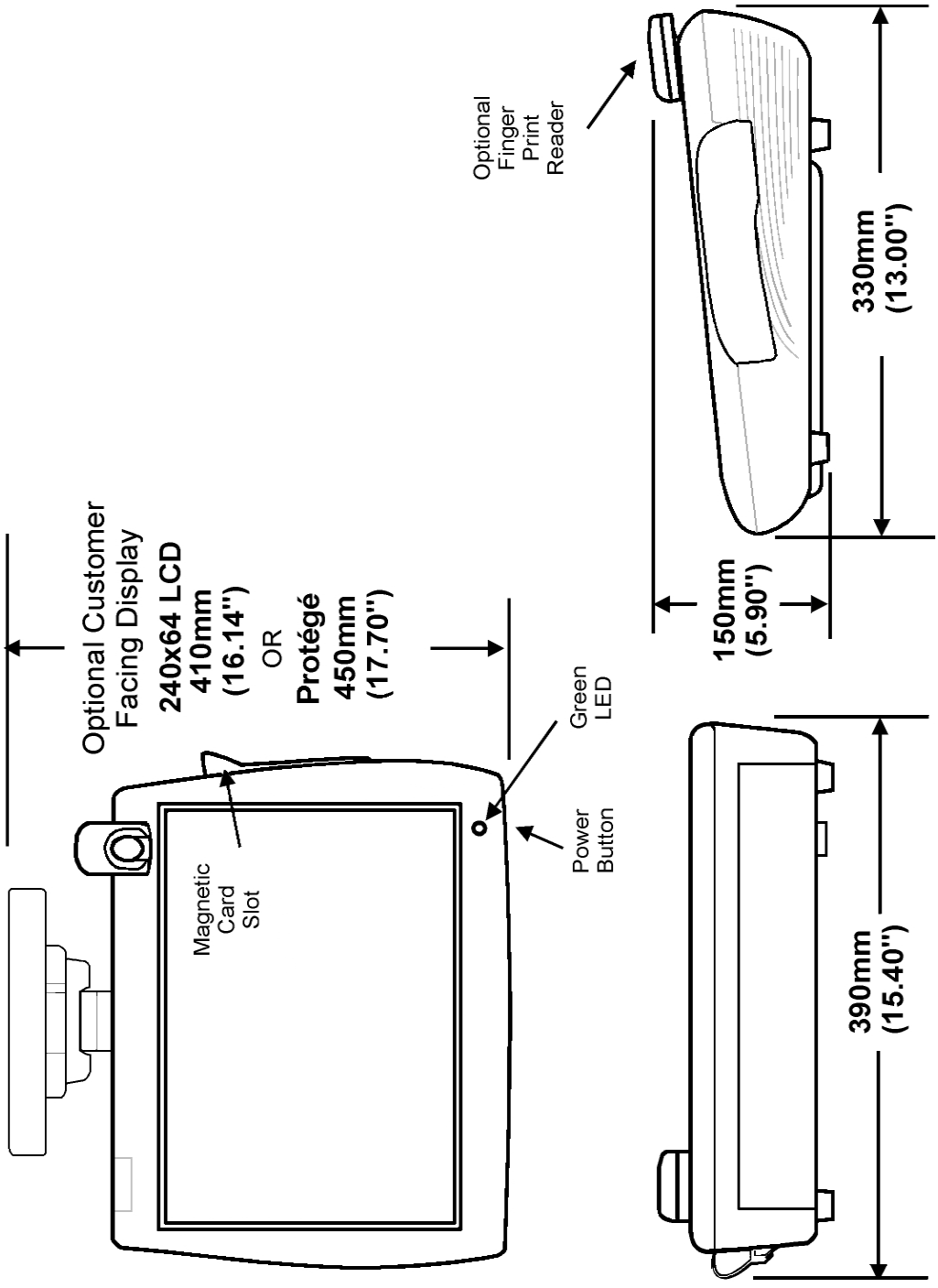


Figure 47 – PC Workstation 2015 - Low Profile with Customer Facing Display

PC Workstation 2015 Adjustable Stand

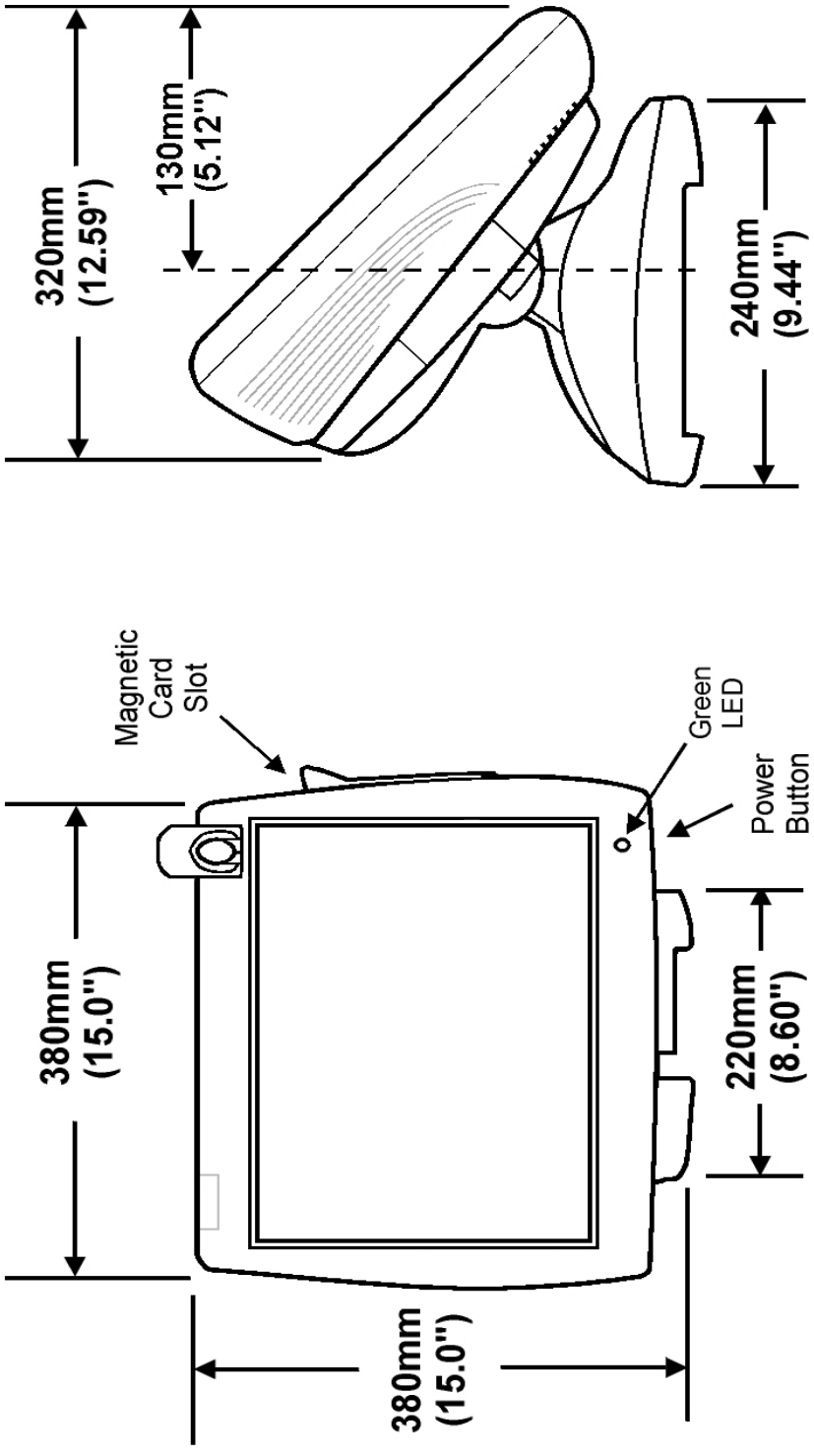


Figure 48 – PC Workstation 2015 Adjustable Stand

PC Workstation 2015 on Stand - LCD Customer Display

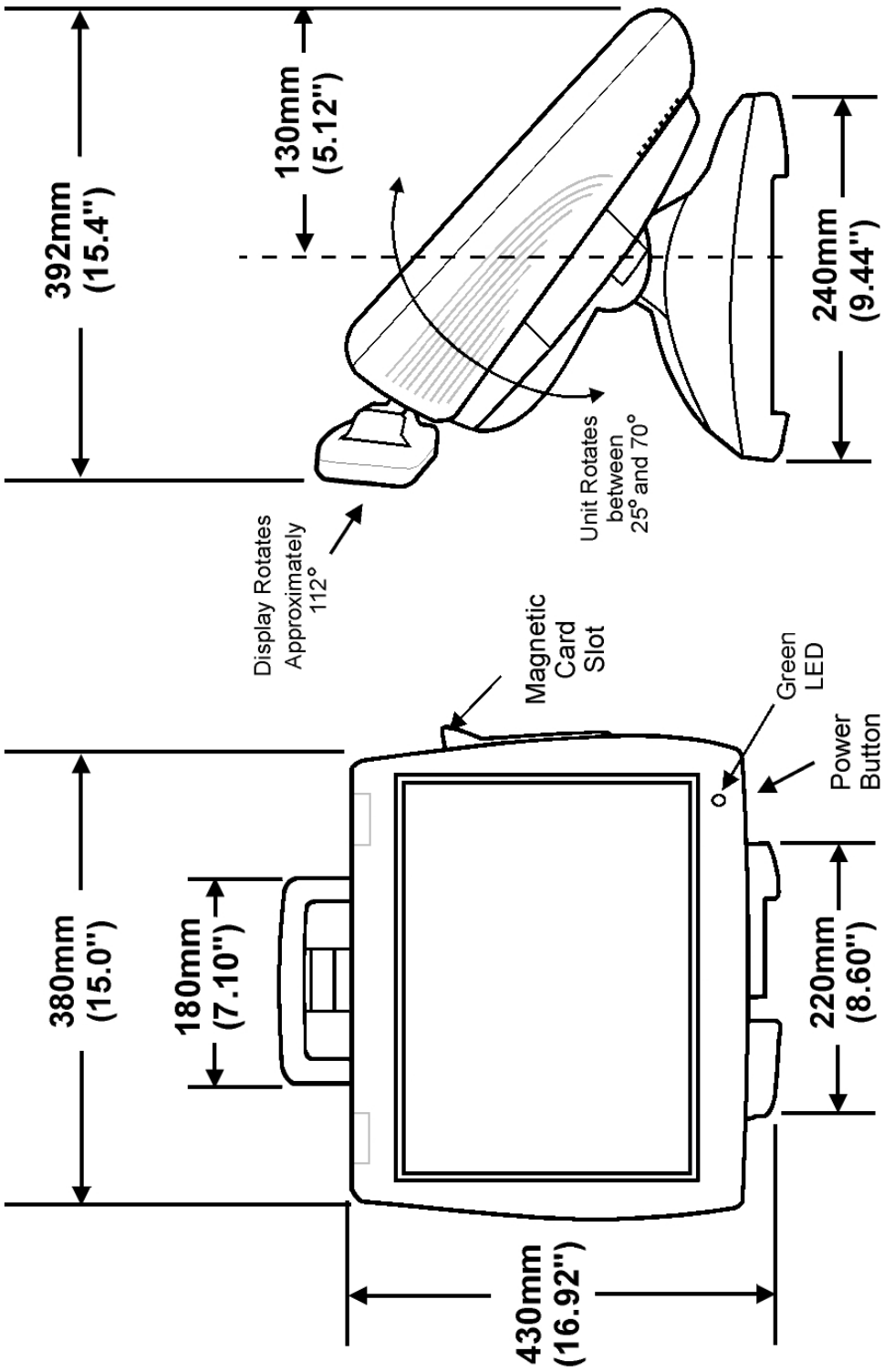


Figure 49 – PC Workstation 2015 on Stand - LCD Customer Display

PC Workstation 2015 - Adjustable Stand - Protege Customer Display

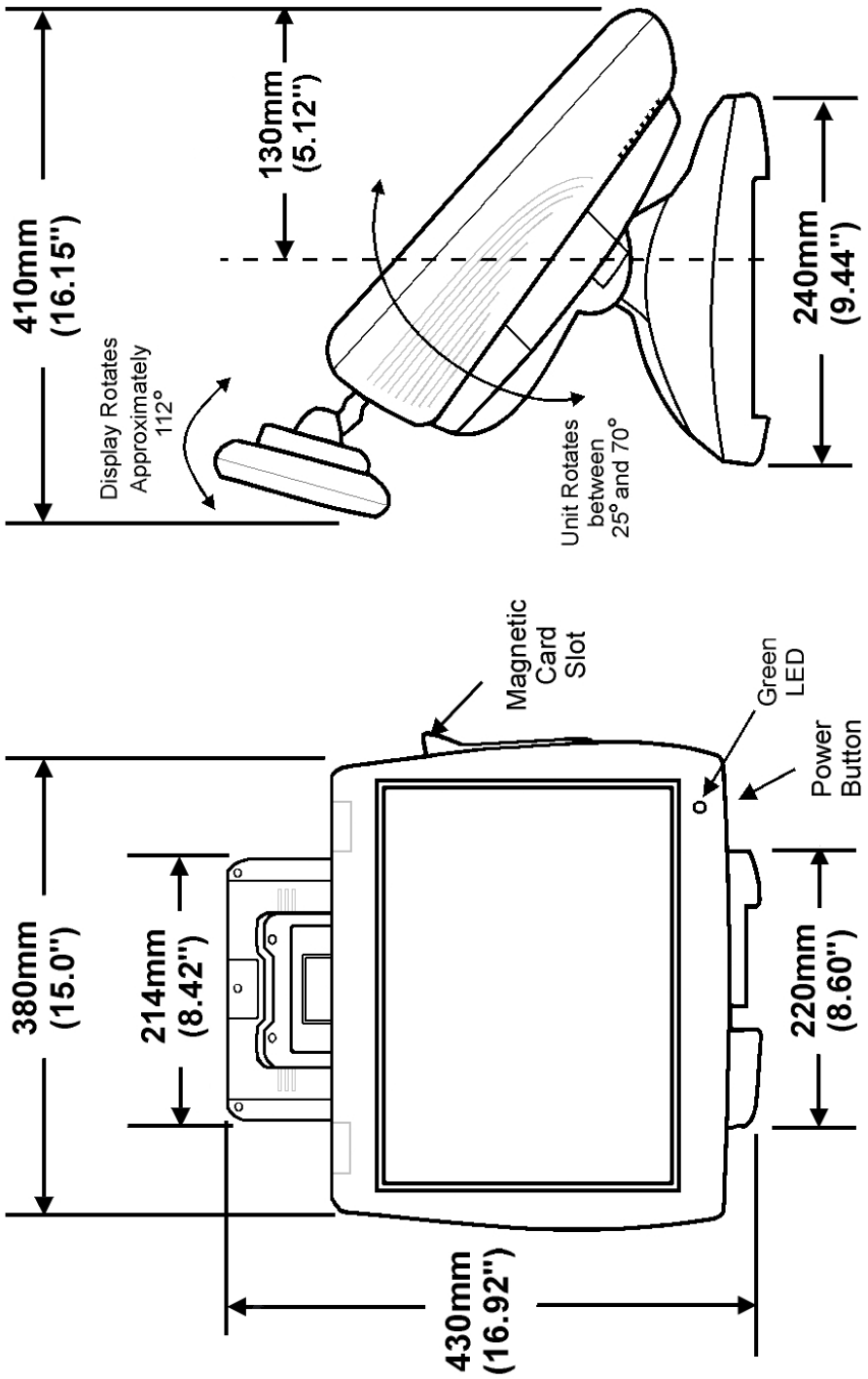


Figure 50 – PC Workstation 2015 - Adjustable Stand - Protege Customer Display

mTablet

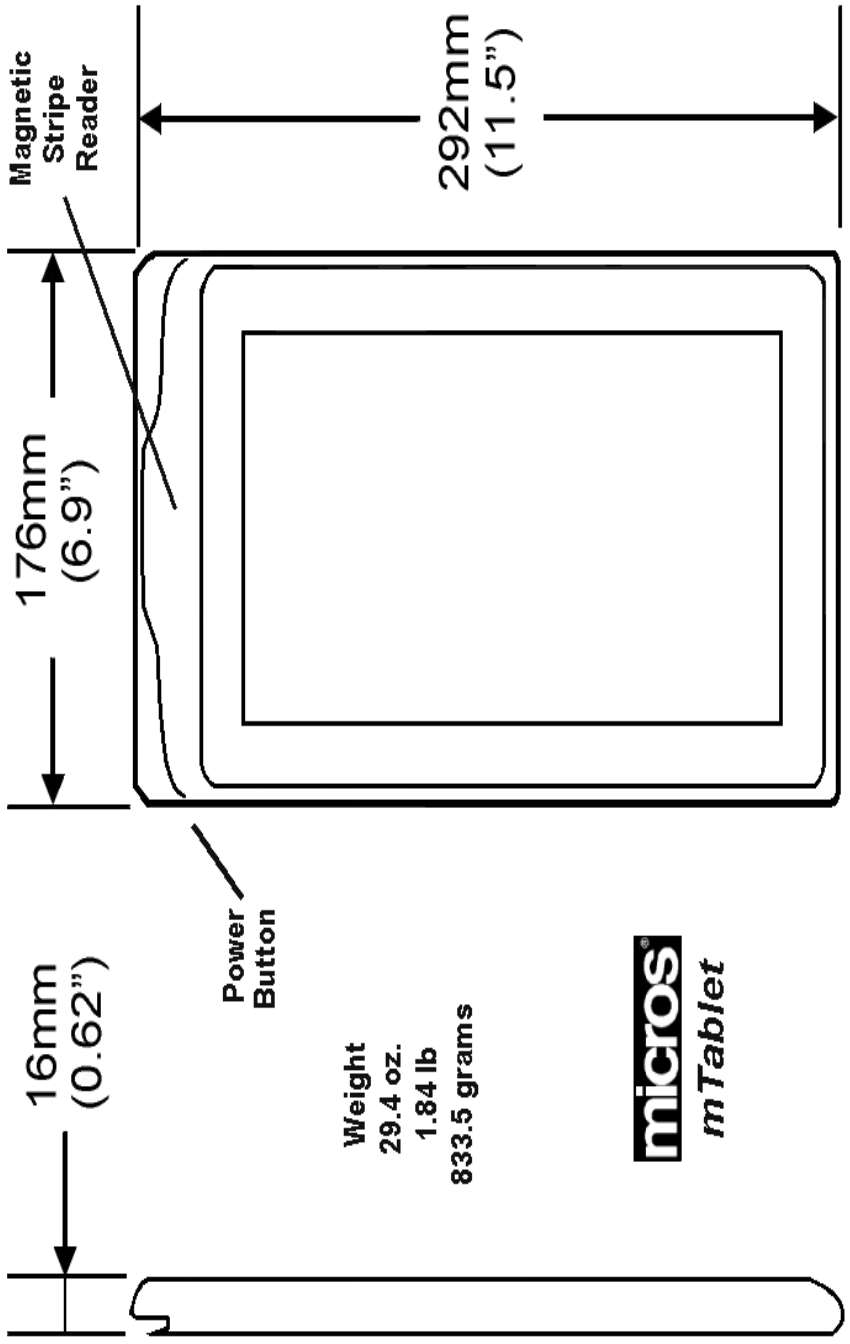


Figure 51 – mTablet

mTablet on mStation /w Peripherals

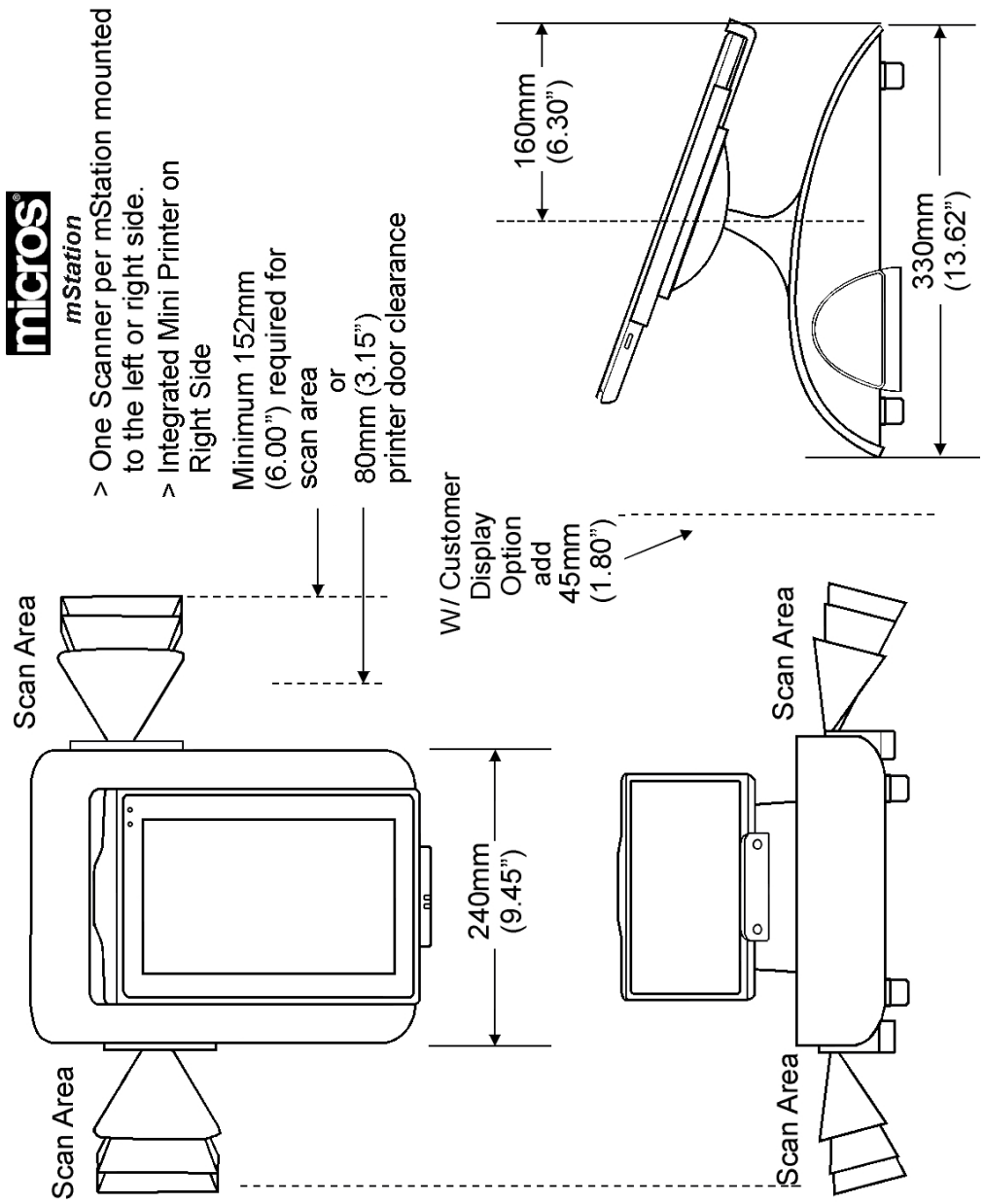


Figure 52 – mTablet on mStation /w Peripherals

Workstation 4/4 LX - Low Profile (LP)

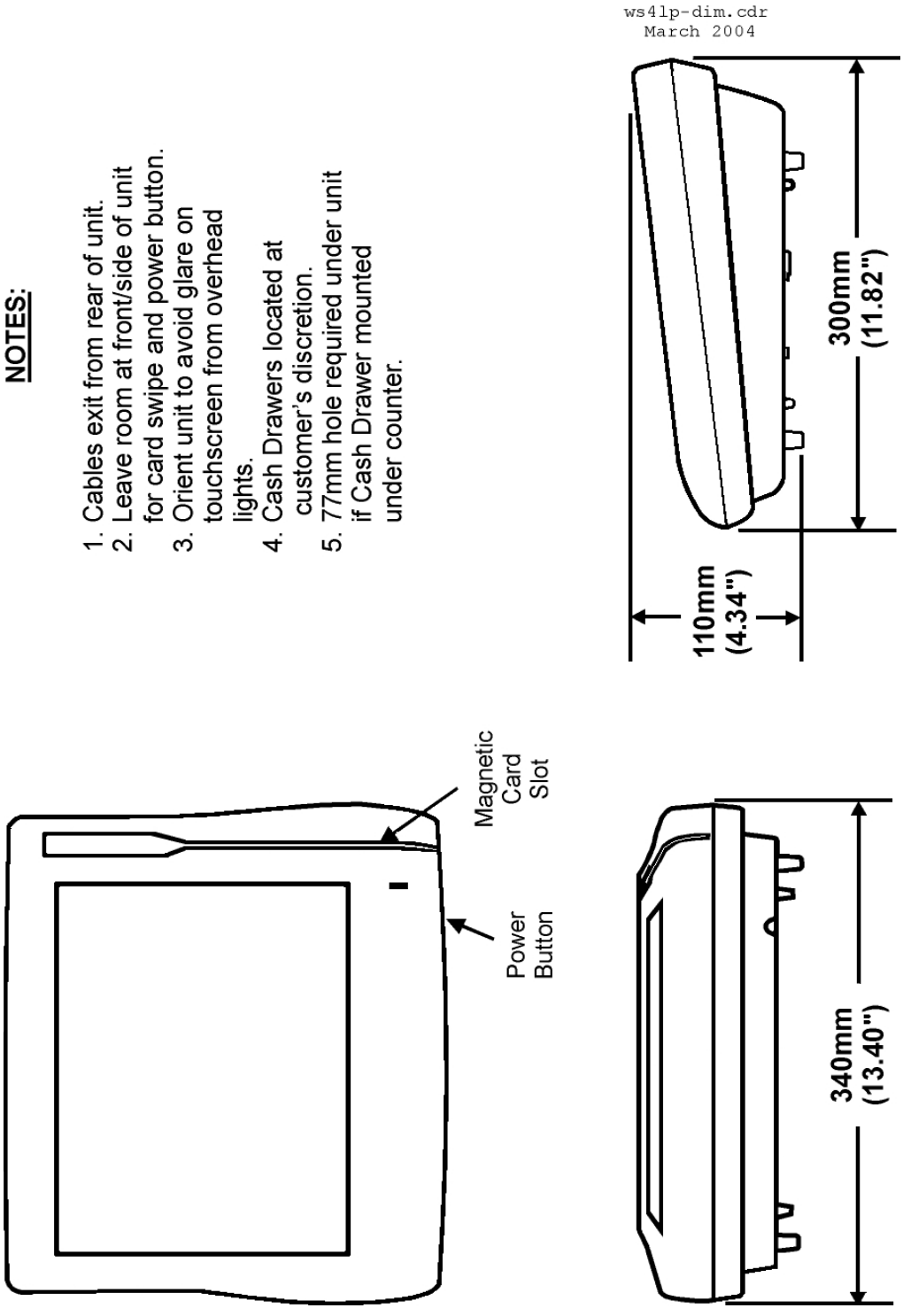

ws4lp-dim.cdr
March 2004
NOTES:
1. Cables exit from rear of unit.
2. Leave room at front/side of unit for card swipe and power button.
3. Orient unit to avoid glare on touchscreen from overhead lights.
4. Cash Drawers located at customer's discretion.
5. 77mm hole required under unit if Cash Drawer mounted under counter.
300mm (11.82")
110mm (4.34")
Magnetic Card Slot
Power Button
340mm (13.40")

Figure 53 – Workstation 4/4 LX - Low Profile (LP)

Workstation 4/4 LX - LP with Rear Customer Display

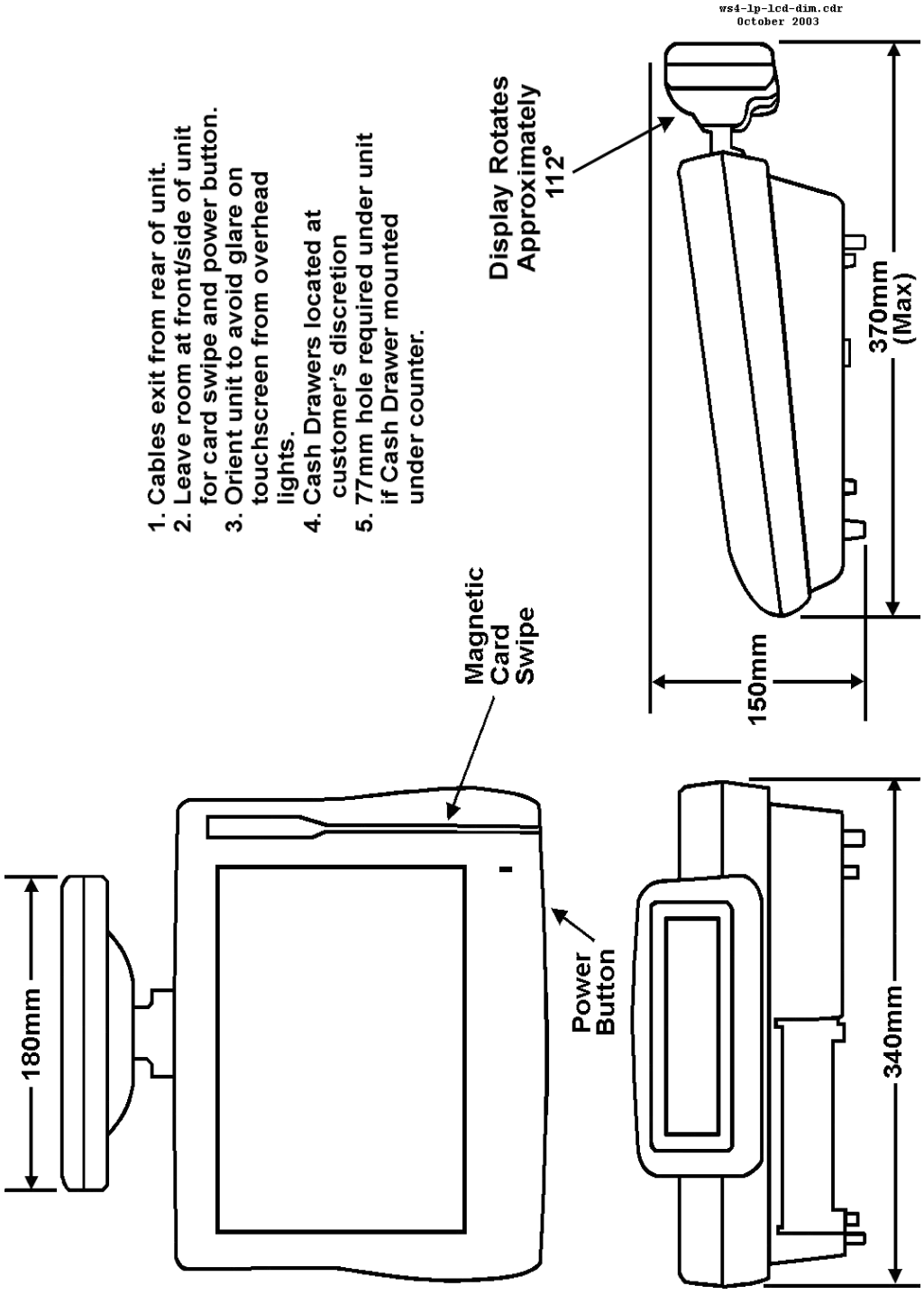

ws4-lp-lcd-dim.cdr
October 2003
1. Cables exit from rear of unit.
2. Leave room at front/side of unit for card swipe and power button.
3. Orient unit to avoid glare on touchscreen from overhead lights.
4. Cash Drawers located at customer's discretion
5. 77mm hole required under unit if Cash Drawer mounted under counter.
Display Rotates Approximately 112°
370mm (Max)
150mm
Magnetic Card Swipe
Power Button
180mm
340mm

Figure 54 – Workstation 4/4 LX - LP with Rear Customer Display

Workstation 4/4 LX on Adjustable Stand

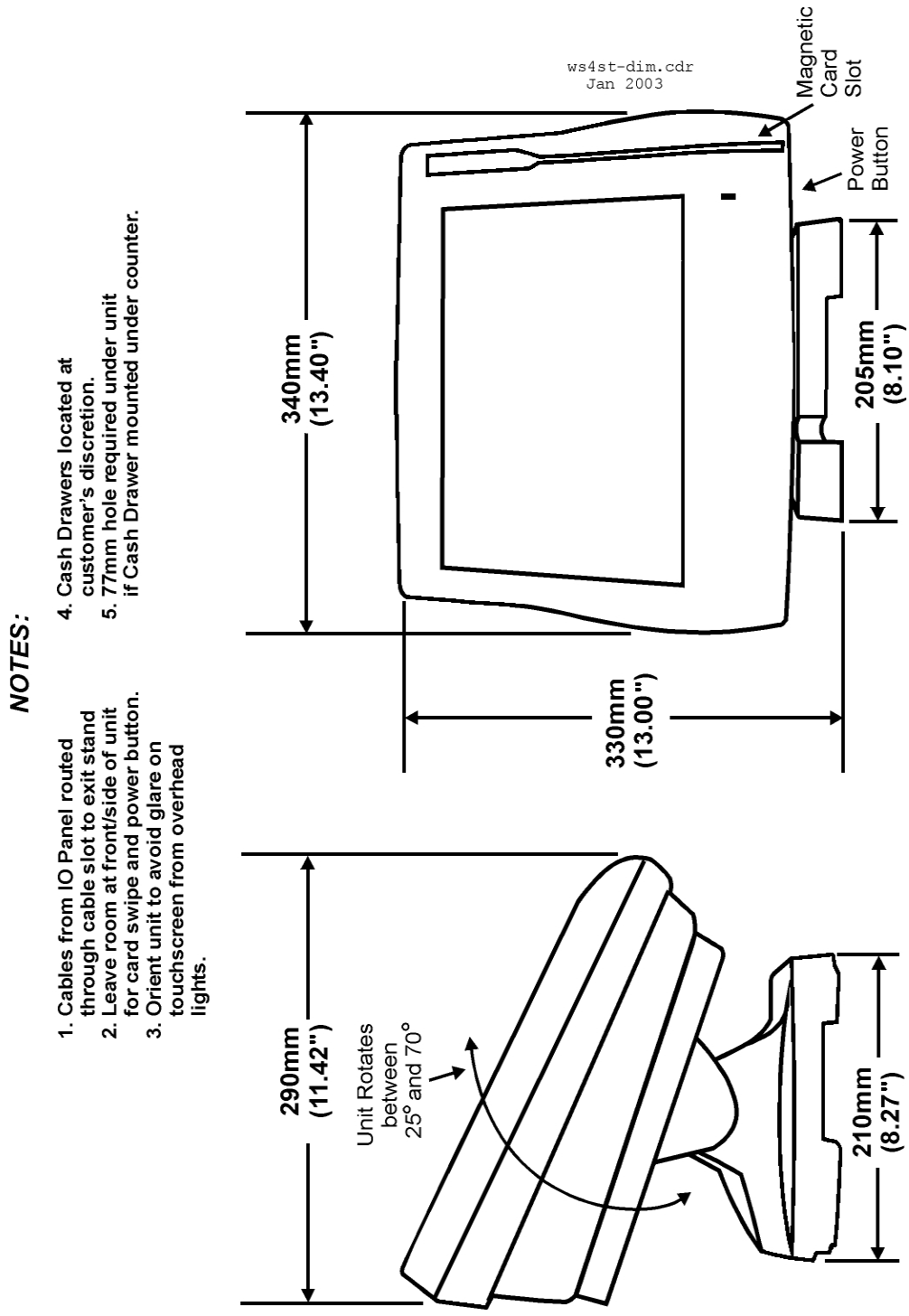

ws4st-dim.cdr
Jan 2003
Magnetic Card Slot
Power Button
340mm (13.40")
205mm (8.10")
330mm (13.00")
290mm (11.42")
Unit Rotates between 25° and 70°
210mm (8.27")
NOTES:
1. Cables from IO Panel routed through cable slot to exit stand
2. Leave room at front/side of unit for card swipe and power button.
3. Orient unit to avoid glare on touchscreen from overhead lights.
4. Cash Drawers located at customer's discretion.
5. 77mm hole required under unit if Cash Drawer mounted under counter.

Figure 55 – Workstation 4/4 LX on Adjustable Stand

Workstation 4/4 LX on Stand /w LCD Customer Display

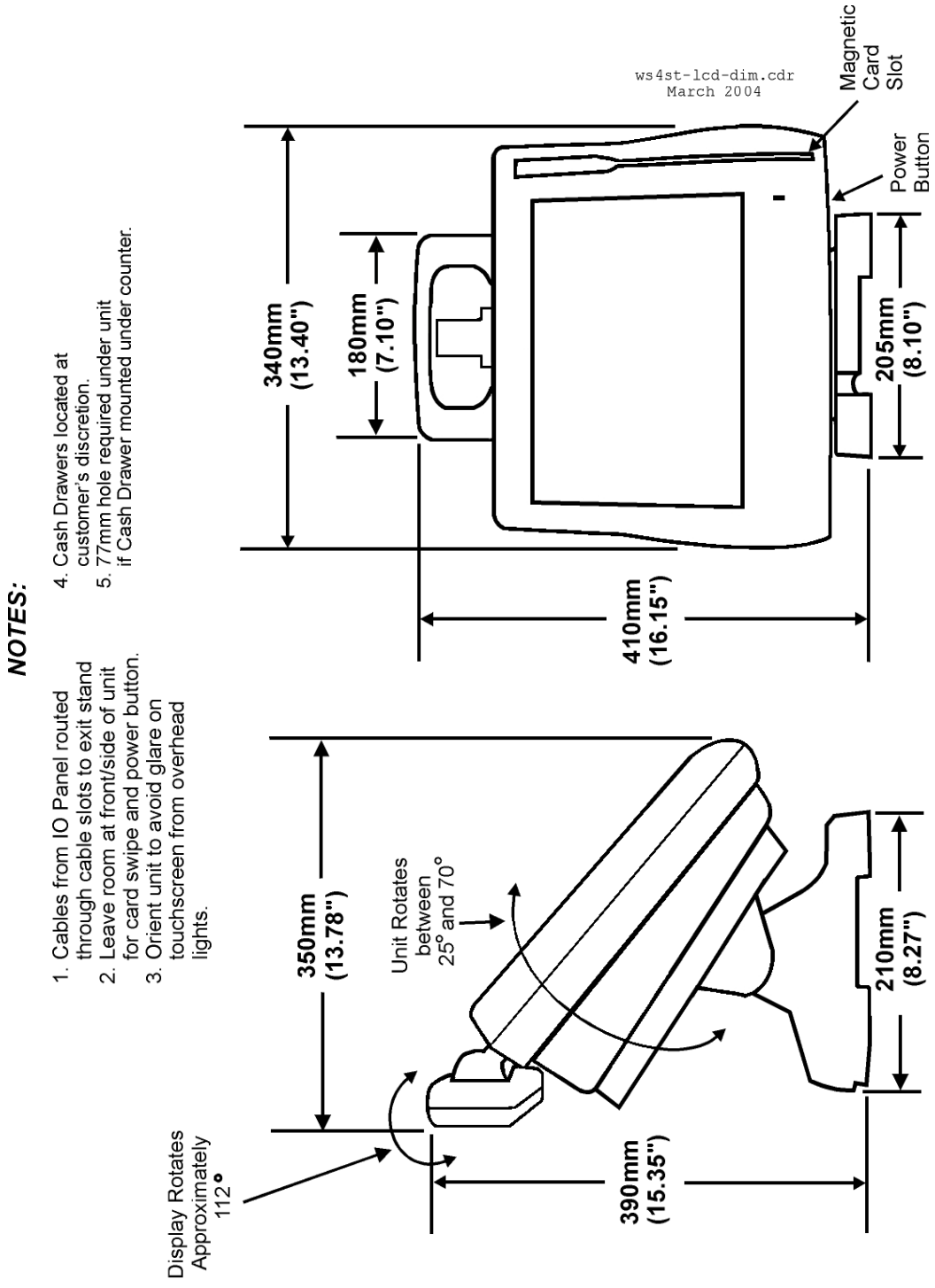

ws4st-lcd-dim.cdr
March 2004
Magnetic Card Slot
Power Button
340mm (13.40")
180mm (7.10")
205mm (8.10")
410mm (16.15")
NOTES:
1. Cables from IO Panel routed through cable slots to exit stand
2. Leave room at front/side of unit for card swipe and power button.
3. Orient unit to avoid glare on touchscreen from overhead lights.
4. Cash Drawers located at customer's discretion.
5. 77mm hole required under unit if Cash Drawer mounted under counter.
350mm (13.78")
Unit Rotates between 25° and 70°
210mm (8.27")
Display Rotates Approximately 112°
390mm (15.35")

Figure 56 – Workstation 4/4 LX on Stand /w LCD Customer Display

Workstation 4/4 LX on Stand /w VFD Customer Display

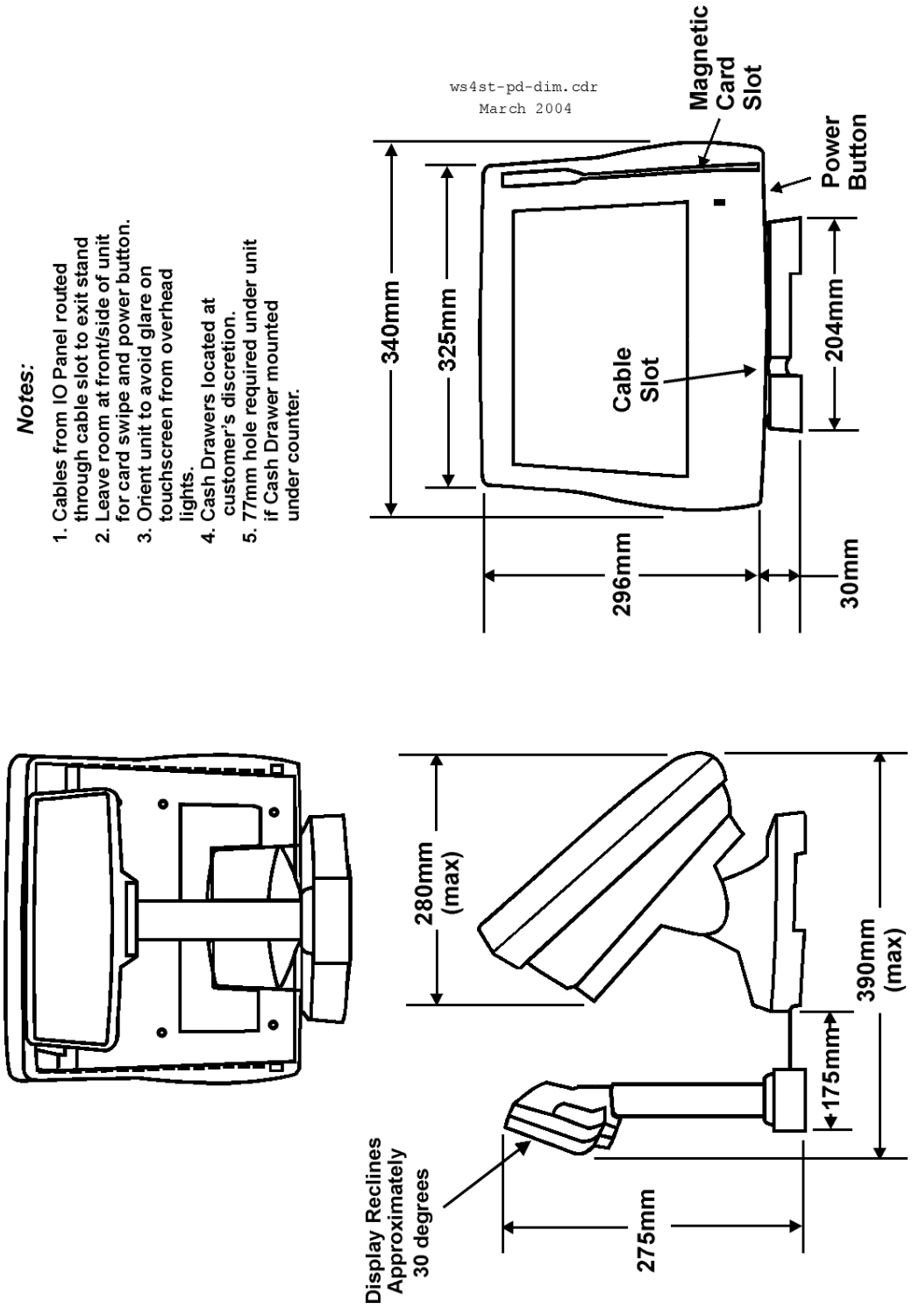


Figure 57 – Workstation 4/4 LX on Stand /w VFD Customer Display

Workstation 4/4 LX on Wall Mount Bracket

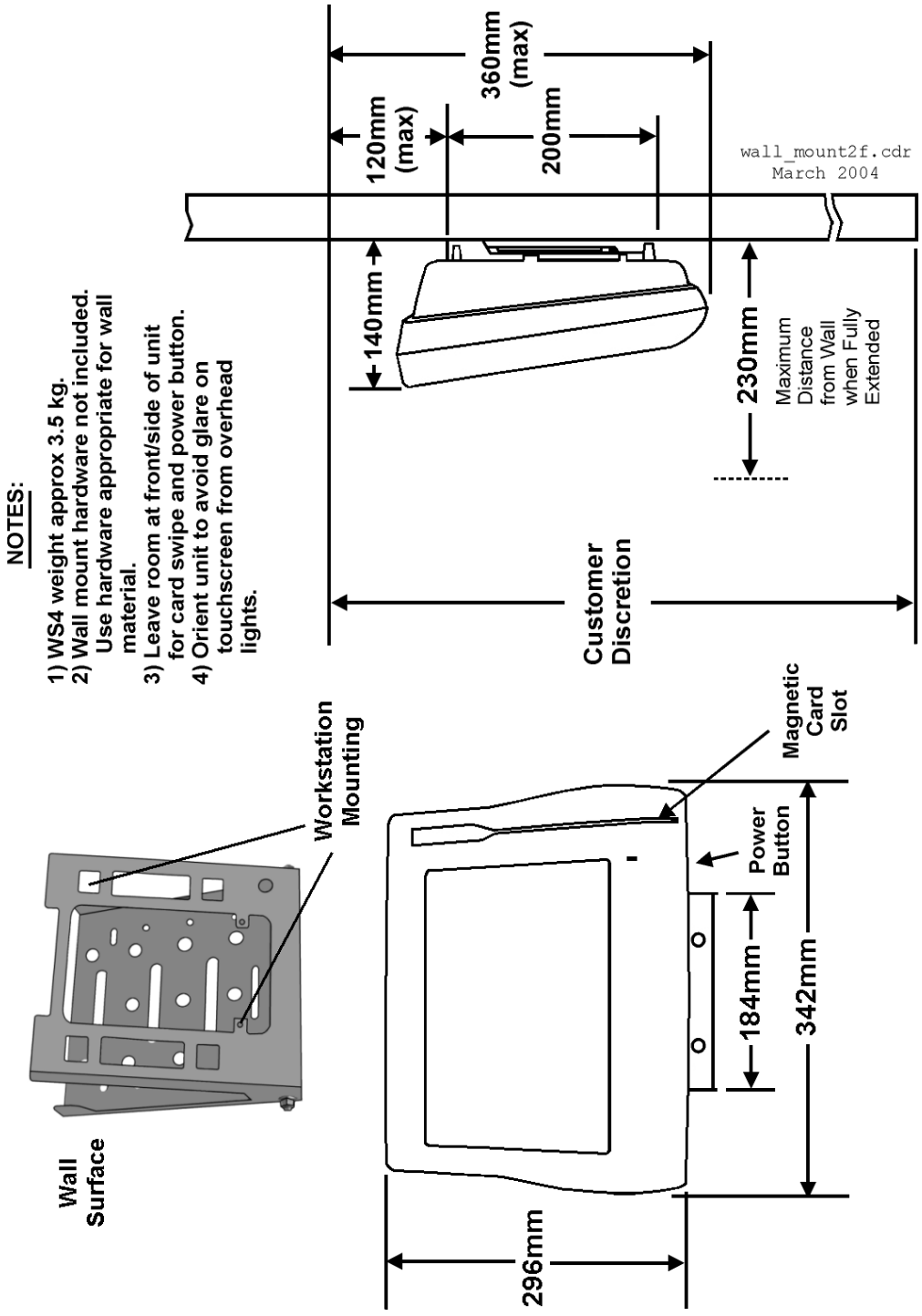


Figure 58 – Workstation 4/4 LX on Wall Mount Bracket

Workstation 5/5A - Low Profile

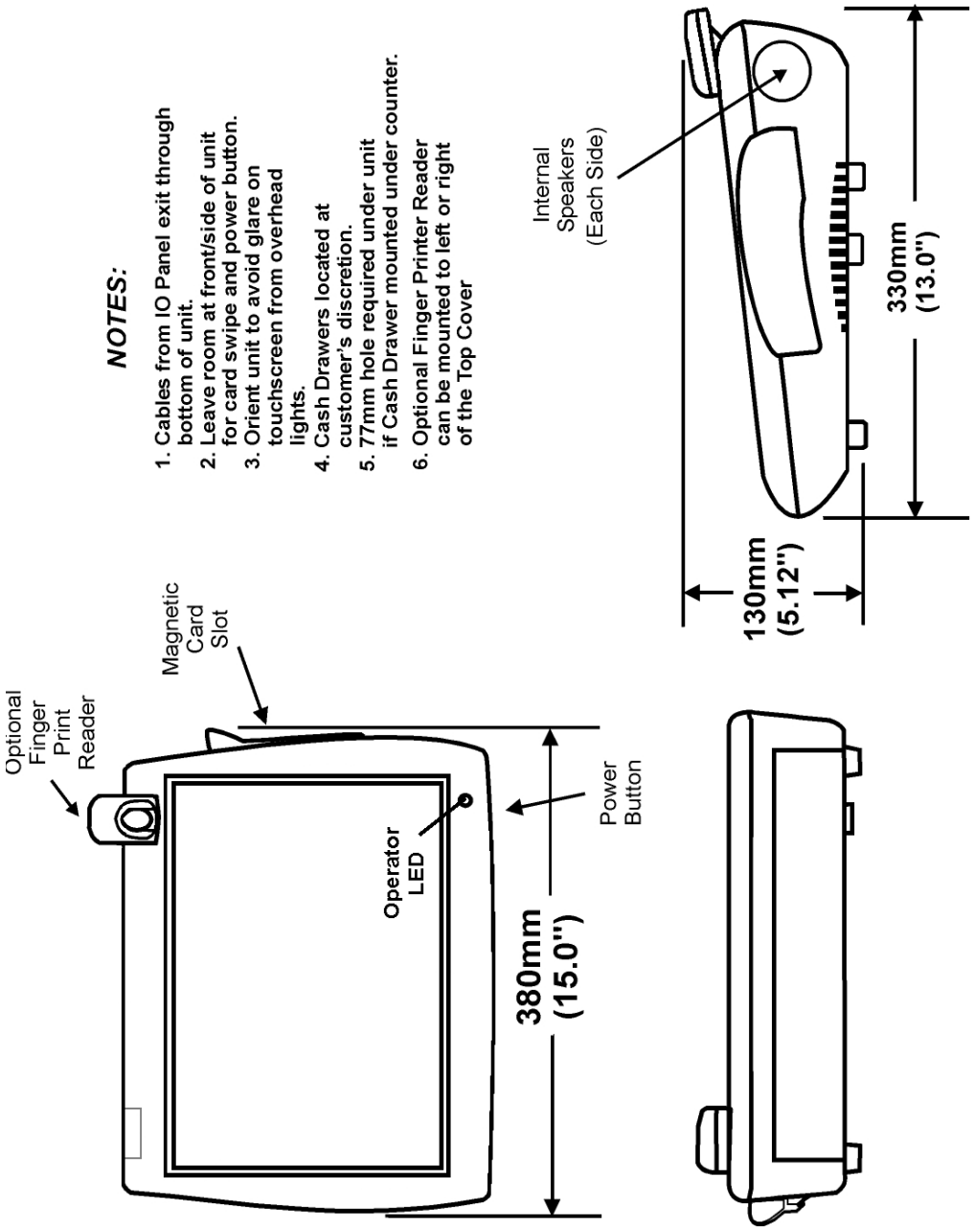

NOTES:
1. Cables from IO Panel exit through bottom of unit.
2. Leave room at front/side of unit for card swipe and power button.
3. Orient unit to avoid glare on touchscreen from overhead lights.
4. Cash Drawers located at customer's discretion.
5. 77mm hole required under unit if Cash Drawer mounted under counter.
6. Optional Finger Printer Reader can be mounted to left or right of the Top Cover
Internal Speakers (Each Side)
330mm (13.0")
130mm (5.12")
Magnetic Card Slot
Optional Finger Print Reader
Operator LED
Power Button
380mm (15.0")

Figure 59 – Workstation 5/5A - Low Profile

Workstation 5/5A with Integrated LCD Customer Display

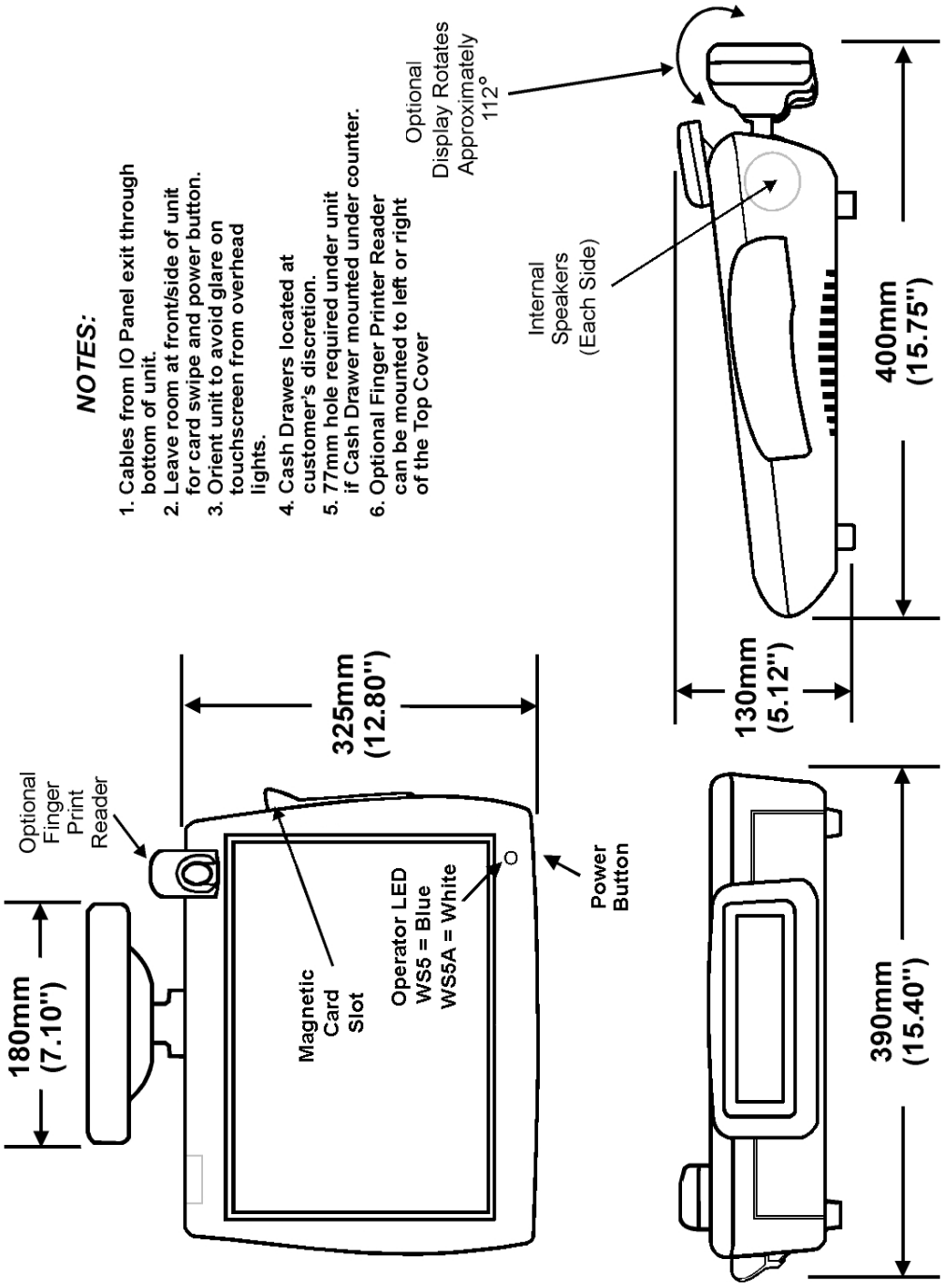

NOTES:
1. Cables from IO Panel exit through bottom of unit.
2. Leave room at front/side of unit for card swipe and power button.
3. Orient unit to avoid glare on touchscreen from overhead lights.
4. Cash Drawers located at customer's discretion.
5. 77mm hole required under unit if Cash Drawer mounted under counter.
6. Optional Finger Printer Reader can be mounted to left or right of the Top Cover
Optional Display Rotates Approximately 112°
Internal Speakers (Each Side)
400mm (15.75")
130mm (5.12")
325mm (12.80")
Optional Finger Print Reader
180mm (7.10")
Magnetic Card Slot
Operator LED WS5 = Blue WS5A = White
Power Button
390mm (15.40")

Figure 60 – Workstation 5/5A with Integrated LCD Customer Display

Workstation 5/5A on Adjustable Stand

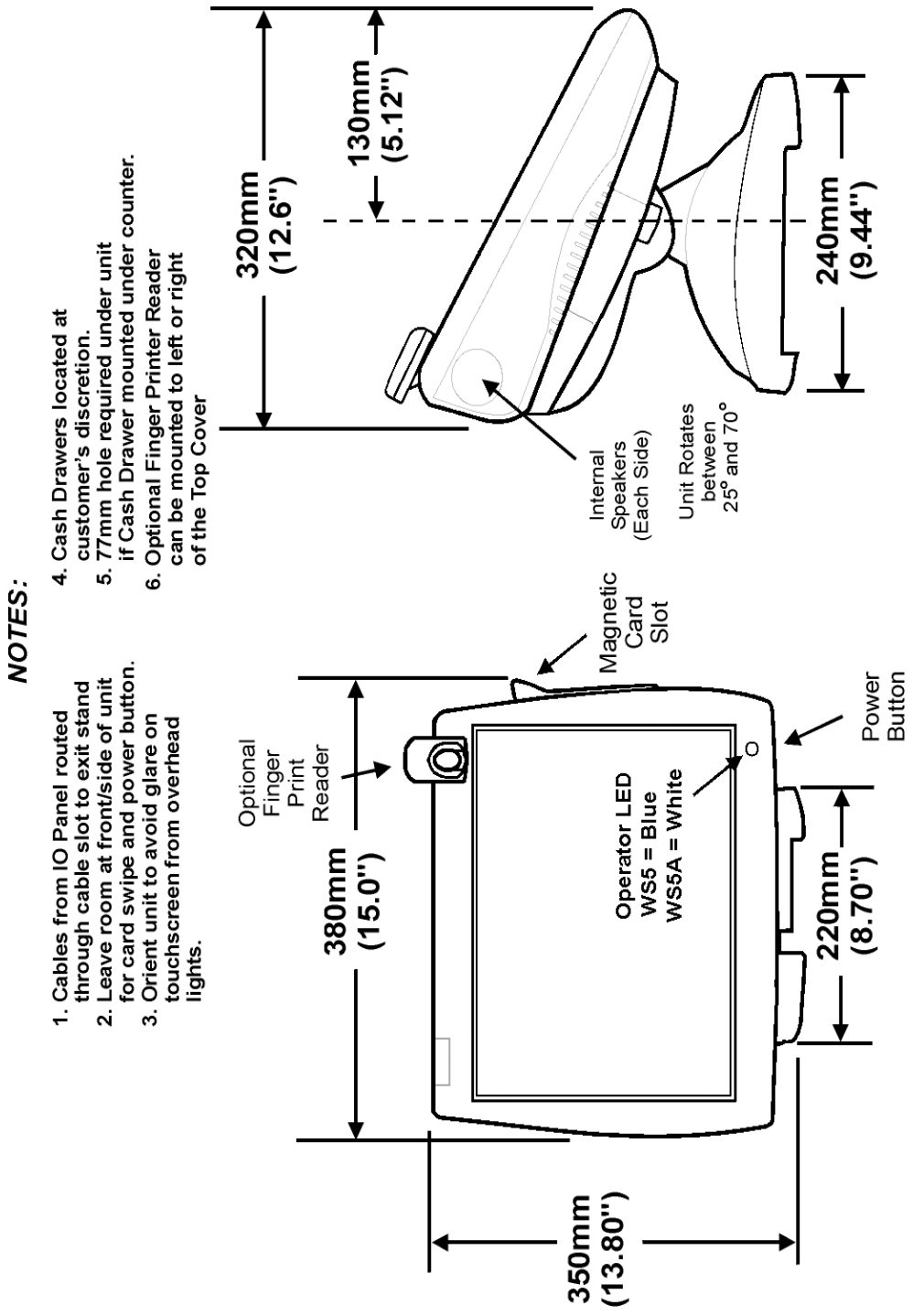

NOTES:
1. Cables from IO Panel routed through cable slot to exit stand
2. Leave room at front/side of unit for card swipe and power button.
3. Orient unit to avoid glare on touchscreen from overhead lights.
4. Cash Drawers located at customer's discretion.
5. 77mm hole required under unit if Cash Drawer mounted under counter.
6. Optional Finger Printer Reader can be mounted to left or right of the Top Cover
320mm (12.6")
130mm (5.12")
240mm (9.44")
Internal Speakers (Each Side)
Unit Rotates between 25° and 70°
Magnetic Card Slot
Optional Finger Print Reader
Power Button
Operator LED
WS5 = Blue
WS5A = White
380mm (15.0")
220mm (8.70")
350mm (13.80")

Figure 61 – Workstation 5/5A on Adjustable Stand

Workstation 5/5A on Stand with LCD Customer Display

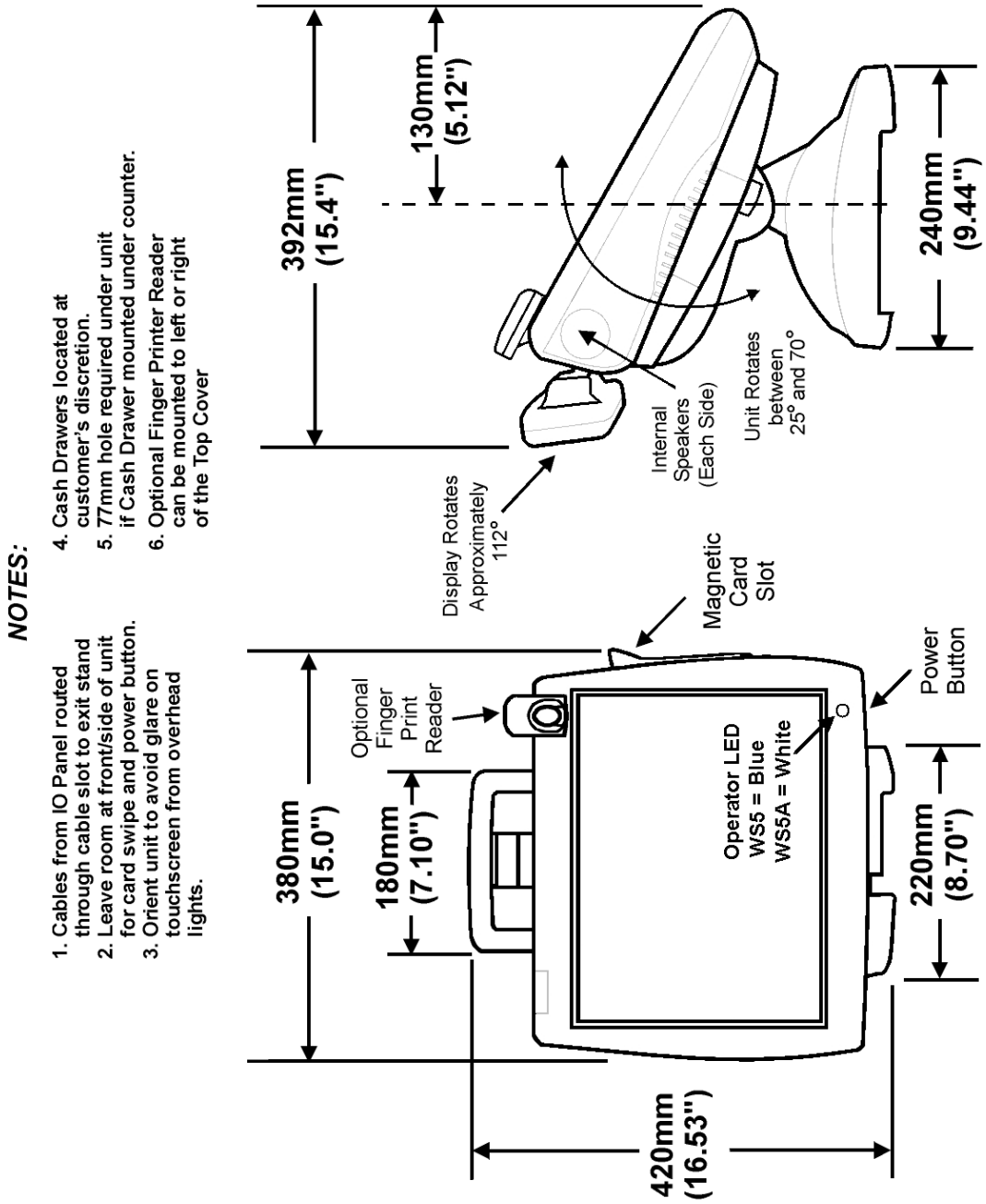

NOTES:
1. Cables from IO Panel routed through cable slot to exit stand
2. Leave room at front/side of unit for card swipe and power button.
3. Orient unit to avoid glare on touchscreen from overhead lights.
4. Cash Drawers located at customer's discretion.
5. 77mm hole required under unit if Cash Drawer mounted under counter.
6. Optional Finger Printer Reader can be mounted to left or right of the Top Cover
392mm (15.4")
130mm (5.12")
240mm (9.44")
Display Rotates Approximately 112°
Internal Speakers (Each Side)
Unit Rotates between 25° and 70°
Magnetic Card Slot
Power Button
Optional Finger Print Reader
Operator LED
WS5 = Blue
WS5A = White
380mm (15.0")
180mm (7.10")
220mm (8.70")
420mm (16.53")

Figure 62 – Workstation 5/5A on Stand with LCD Customer Display

Workstation 5/5A on Stand with Protege Customer Display

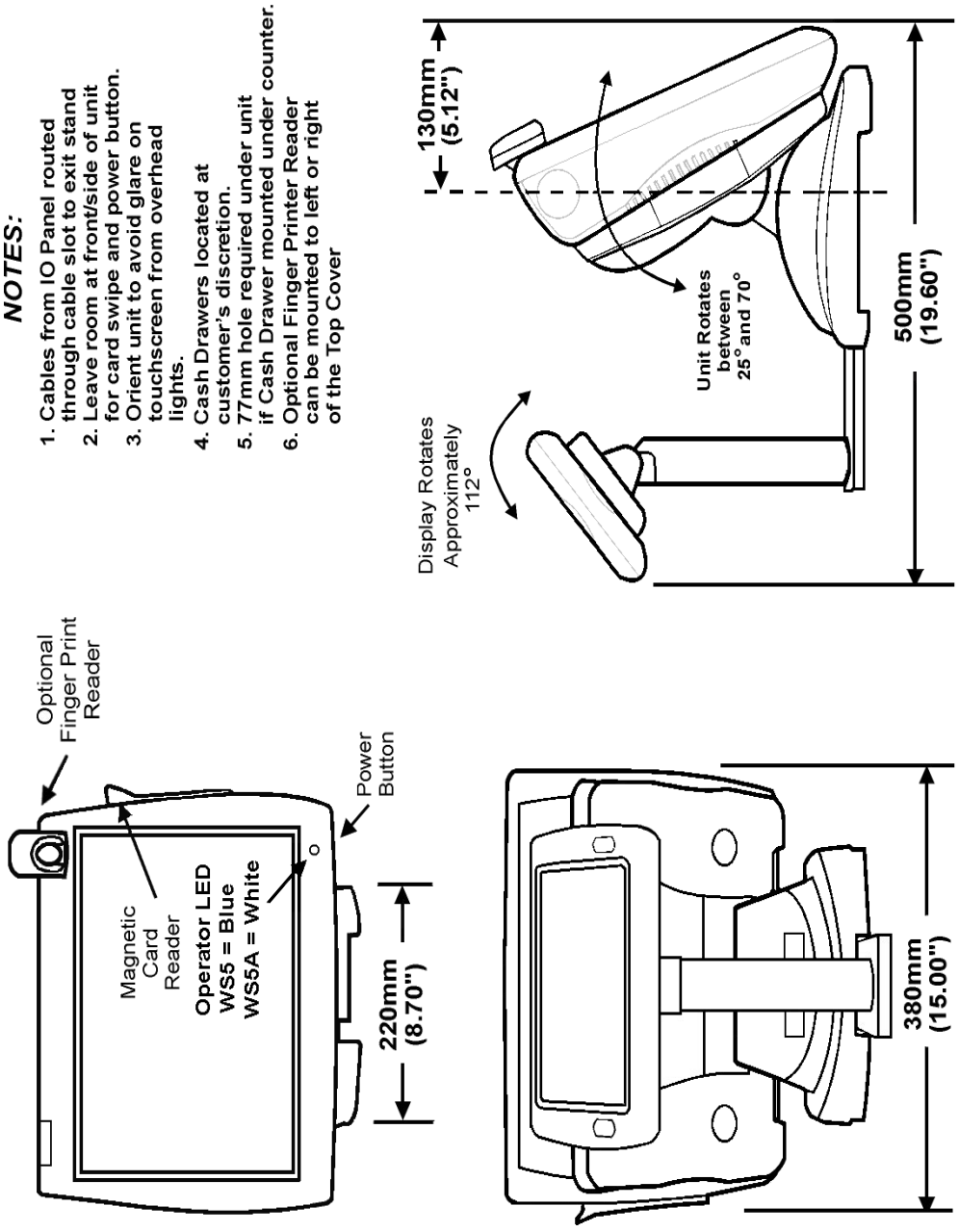

NOTES:
1. Cables from IO Panel routed through cable slot to exit stand
2. Leave room at front/side of unit for card swipe and power button.
3. Orient unit to avoid glare on touchscreen from overhead lights.
4. Cash Drawers located at customer's discretion.
5. 77mm hole required under unit if Cash Drawer mounted under counter.
6. Optional Finger Printer Reader can be mounted to left or right of the Top Cover
130mm (5.12")
Unit Rotates between 25° and 70°
500mm (19.60")
Display Rotates Approximately 112°
Optional Finger Print Reader
Power Button
Magnetic Card Reader
Operator LED
WS5 = Blue
WS5A = White
220mm (8.70")
380mm (15.00")

Figure 63 – Workstation 5/5A on Stand with Protege Customer Display

Workstation 5/5A on Stand /w Vivo Payment Terminal

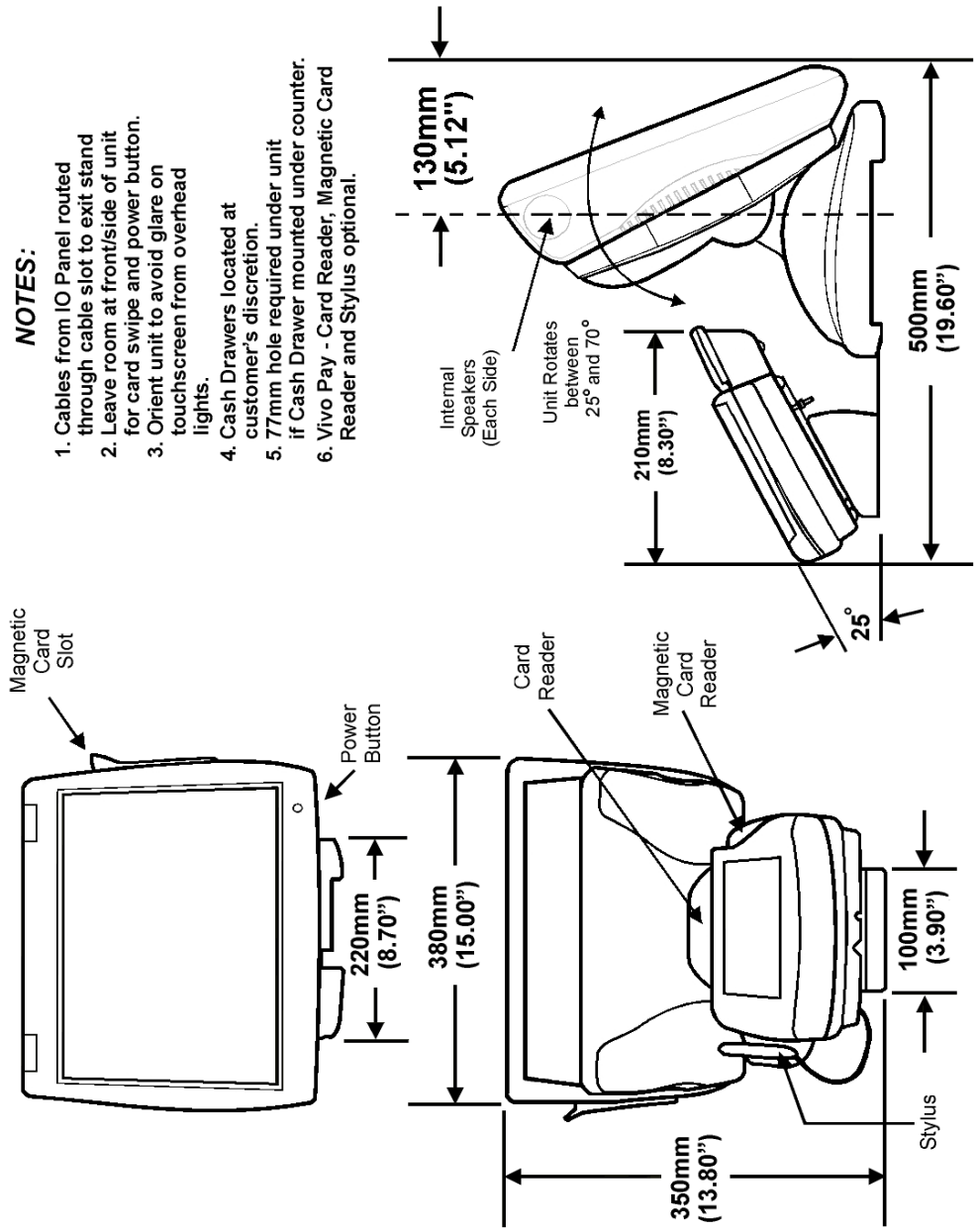

NOTES:
1. Cables from IO Panel routed through cable slot to exit stand
2. Leave room at front/side of unit for card swipe and power button.
3. Orient unit to avoid glare on touchscreen from overhead lights.
4. Cash Drawers located at customer's discretion.
5. 77mm hole required under unit if Cash Drawer mounted under counter.
6. Vivo Pay - Card Reader, Magnetic Card Reader and Stylus optional.
130mm (5.12")
Internal Speakers (Each Side)
Unit Rotates between 25° and 70°
210mm (8.30")
500mm (19.60")
25°
Magnetic Card Slot
Power Button
220mm (8.70")
380mm (15.00")
Card Reader
Magnetic Card Reader
100mm (3.90")
Stylus
350mm (13.80")

Figure 64 – Workstation 5/5A on Stand /w Vivo Payment Terminal

KW270 Low Profile

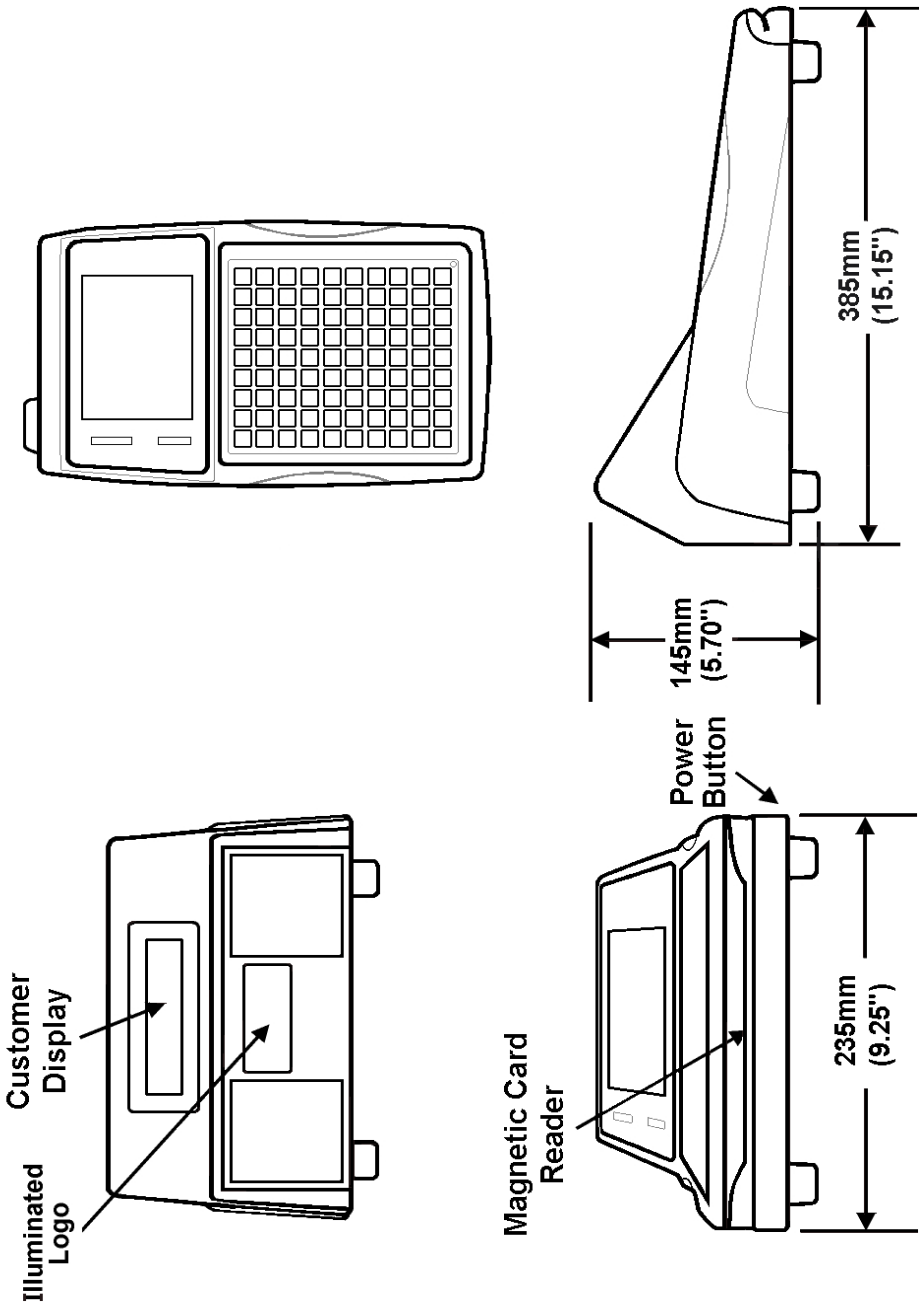


Figure 65 – KW270 Low Profile

KW270 on Stand /w Updated Scanner Housing

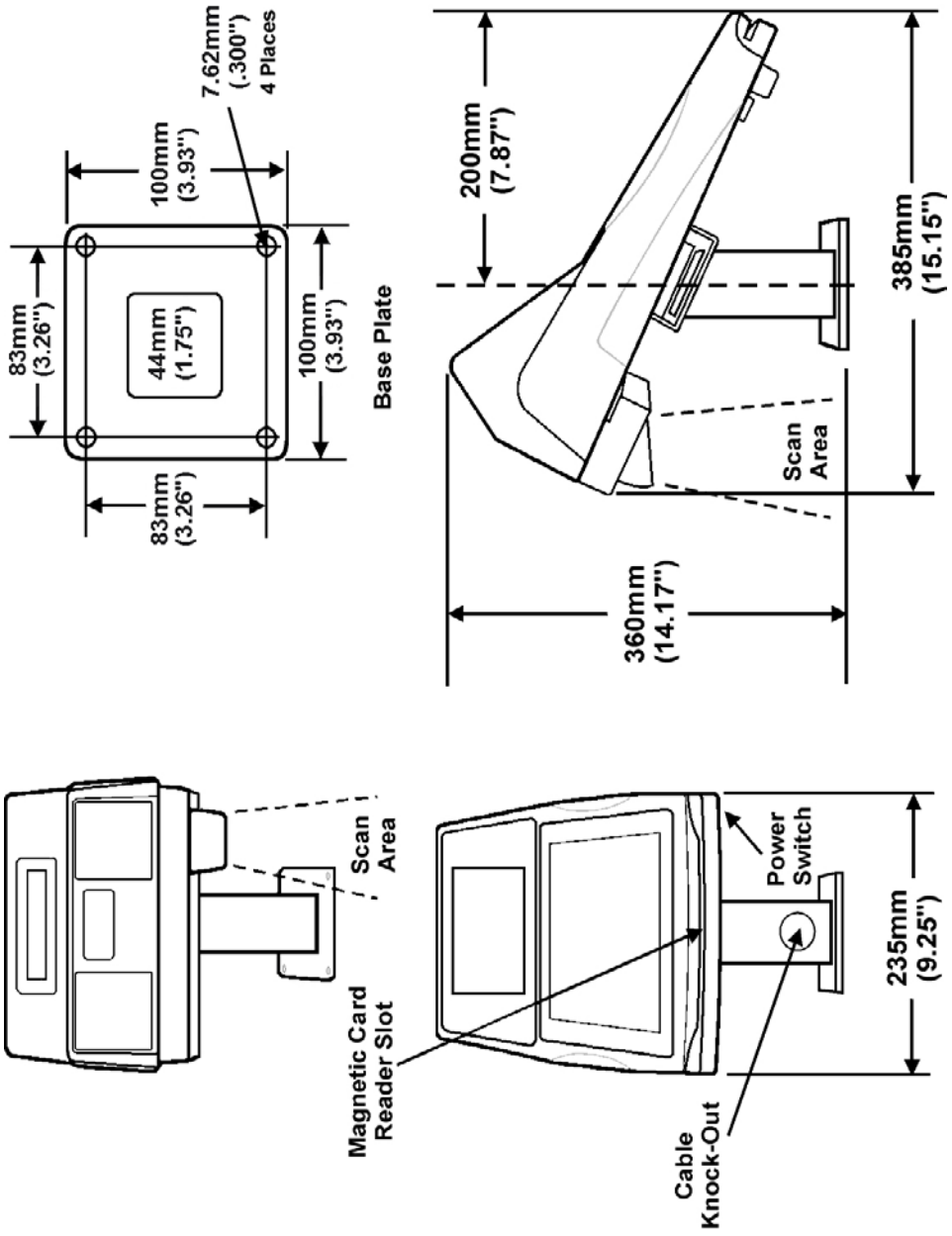


Figure 66 – KW270 on Stand /w Updated Scanner Housing

mTablet Multi-Bay Charger - Wall Mount

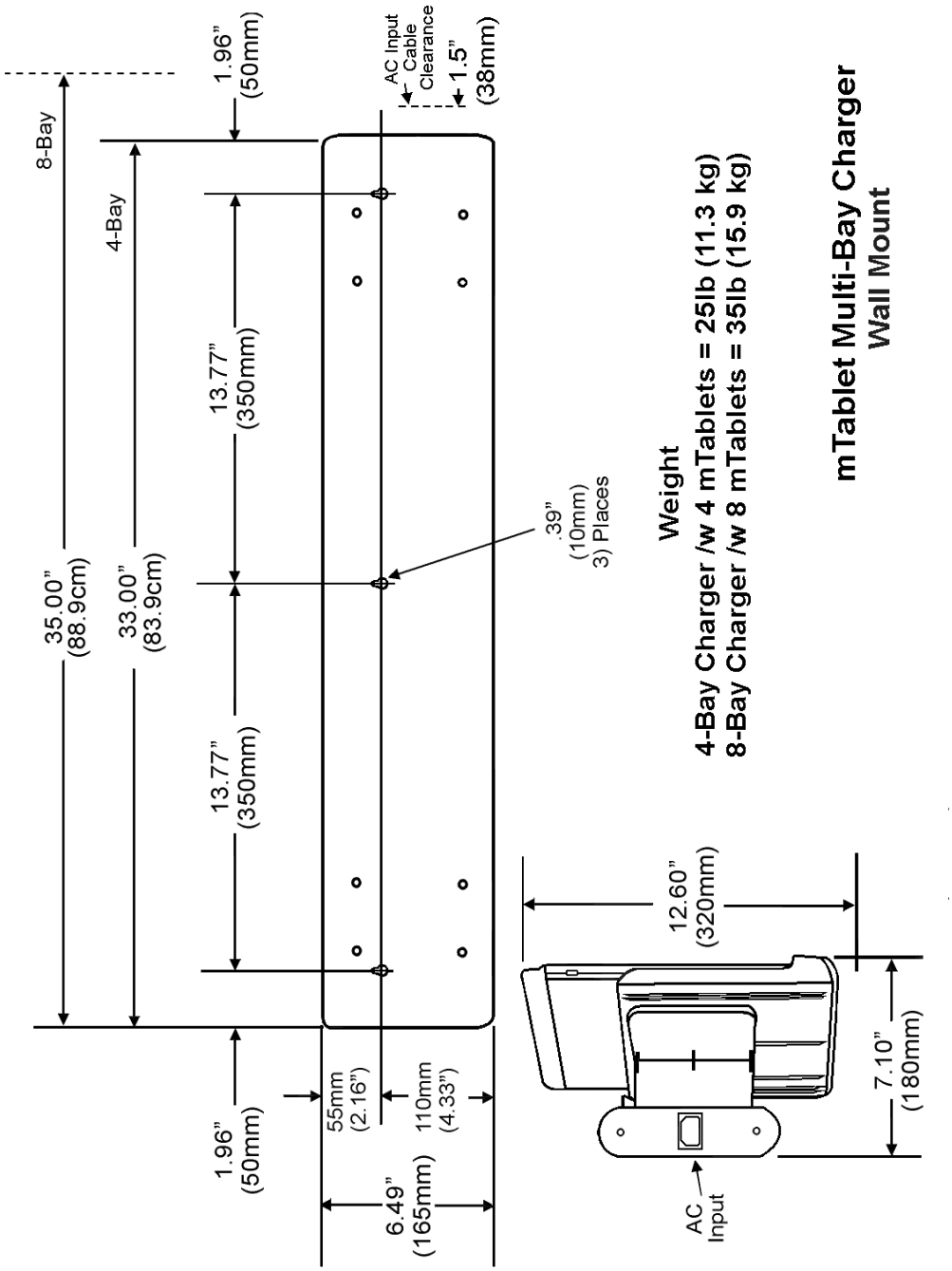


Figure 67 – mTablet Multi-Bay Charger - Wall Mount

mTablet Multi-Bay Charger - Surface Mount

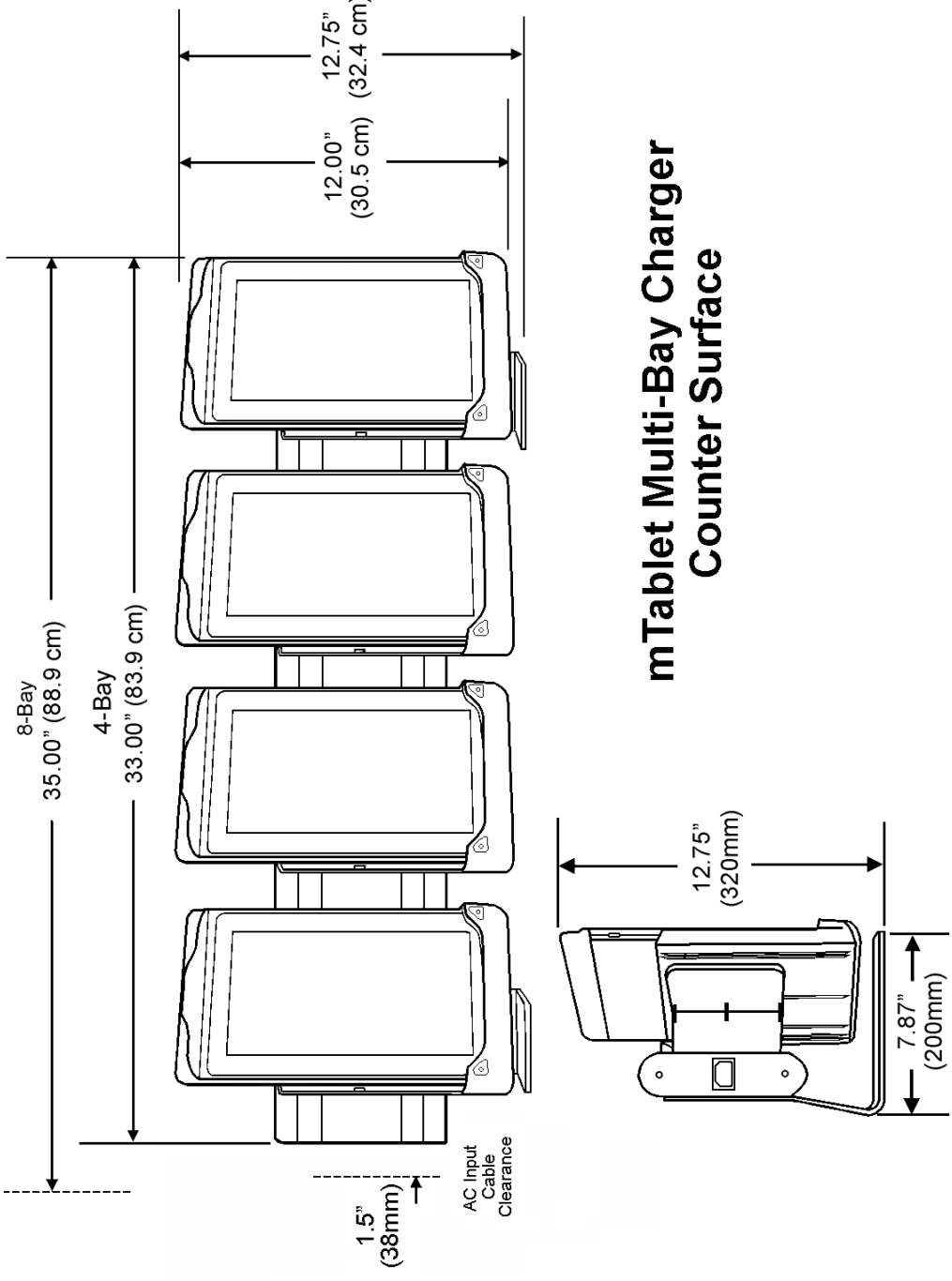


Figure 68 – mTablet Multi-Bay Charger - Surface Mount

Order Confirmation Controller and Wall Bracket

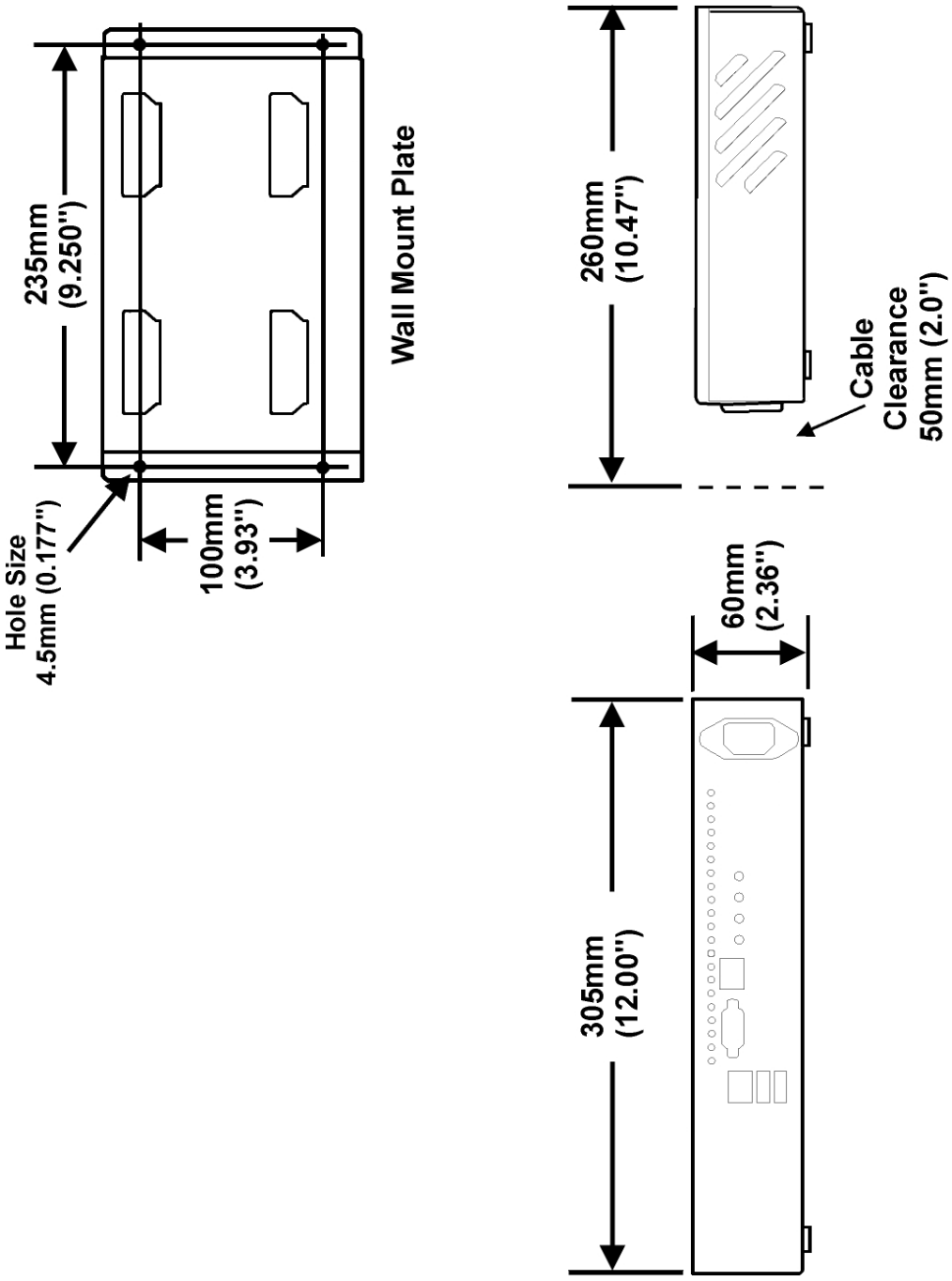


Figure 69 – Order Confirmation Controller and Wall Bracket

Order Confirmation System Remote Display Pedestal - Basic

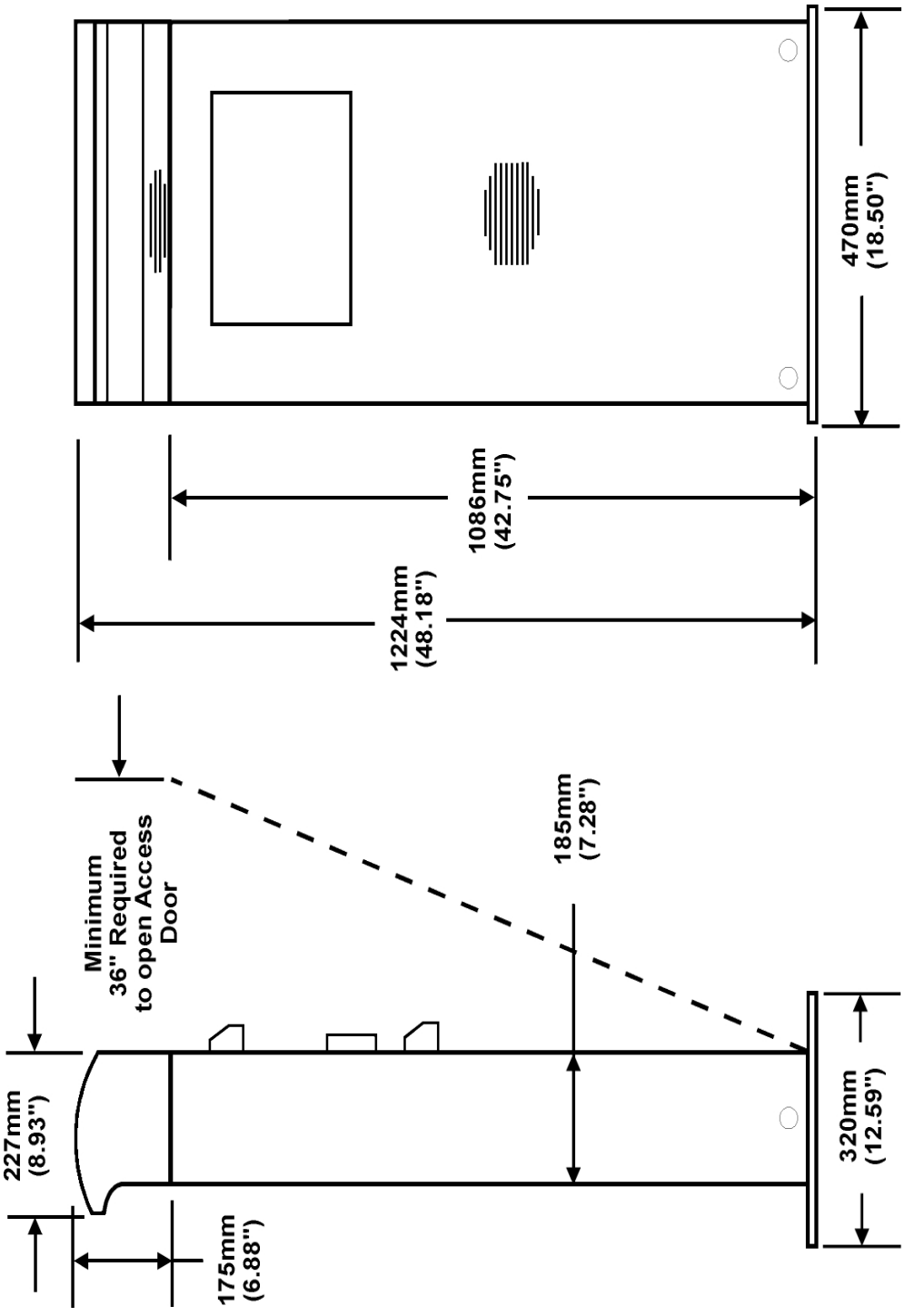


Figure 70 – Order Confirmation System Remote Display Pedestal - Basic

Order Confirmation System Remote Display Pedestal - Detail 1

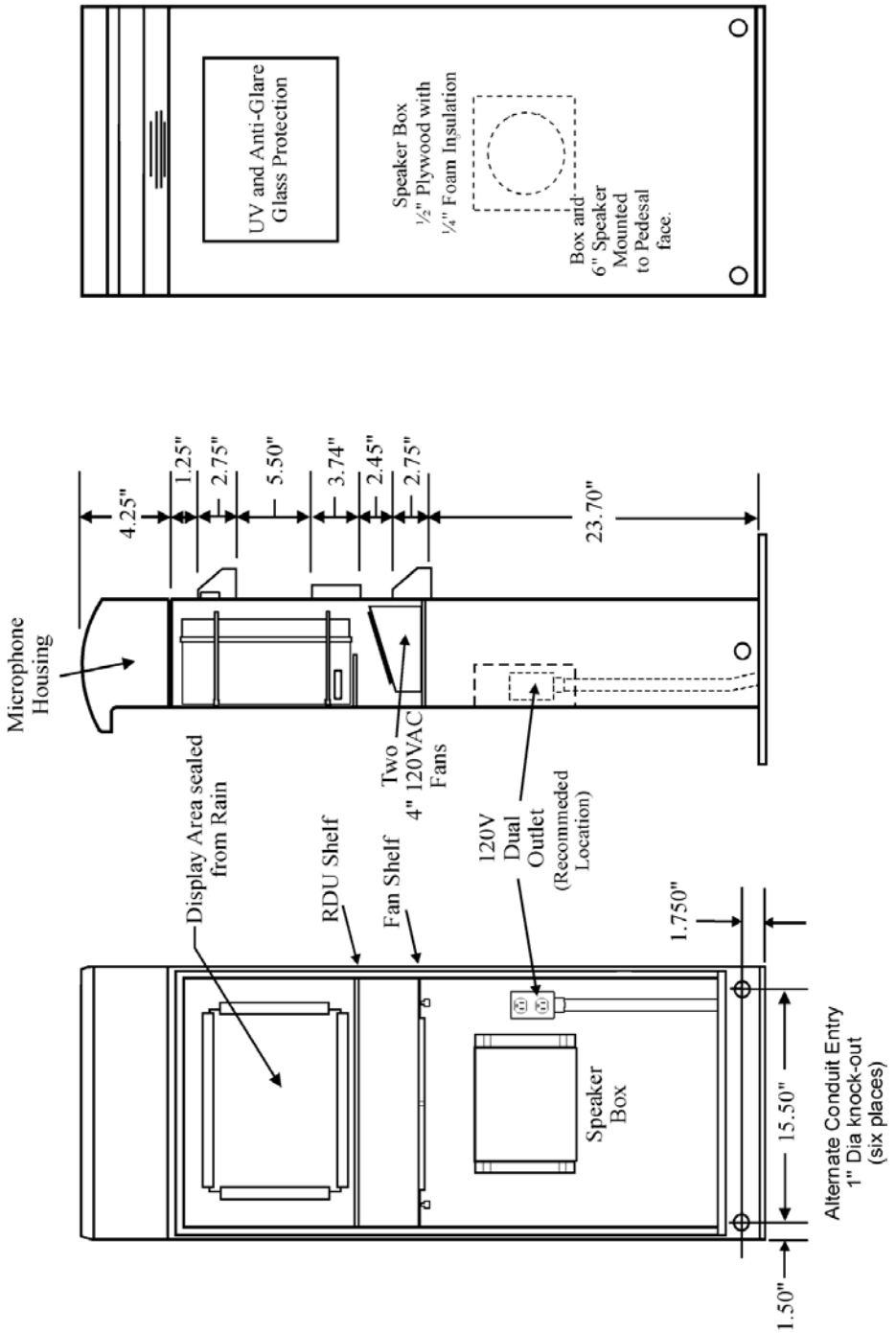


Figure 71 – Order Confirmation System Remote Display Pedestal - Detail 1

Order Confirmation System Remote Display Pedestal - Detail 2

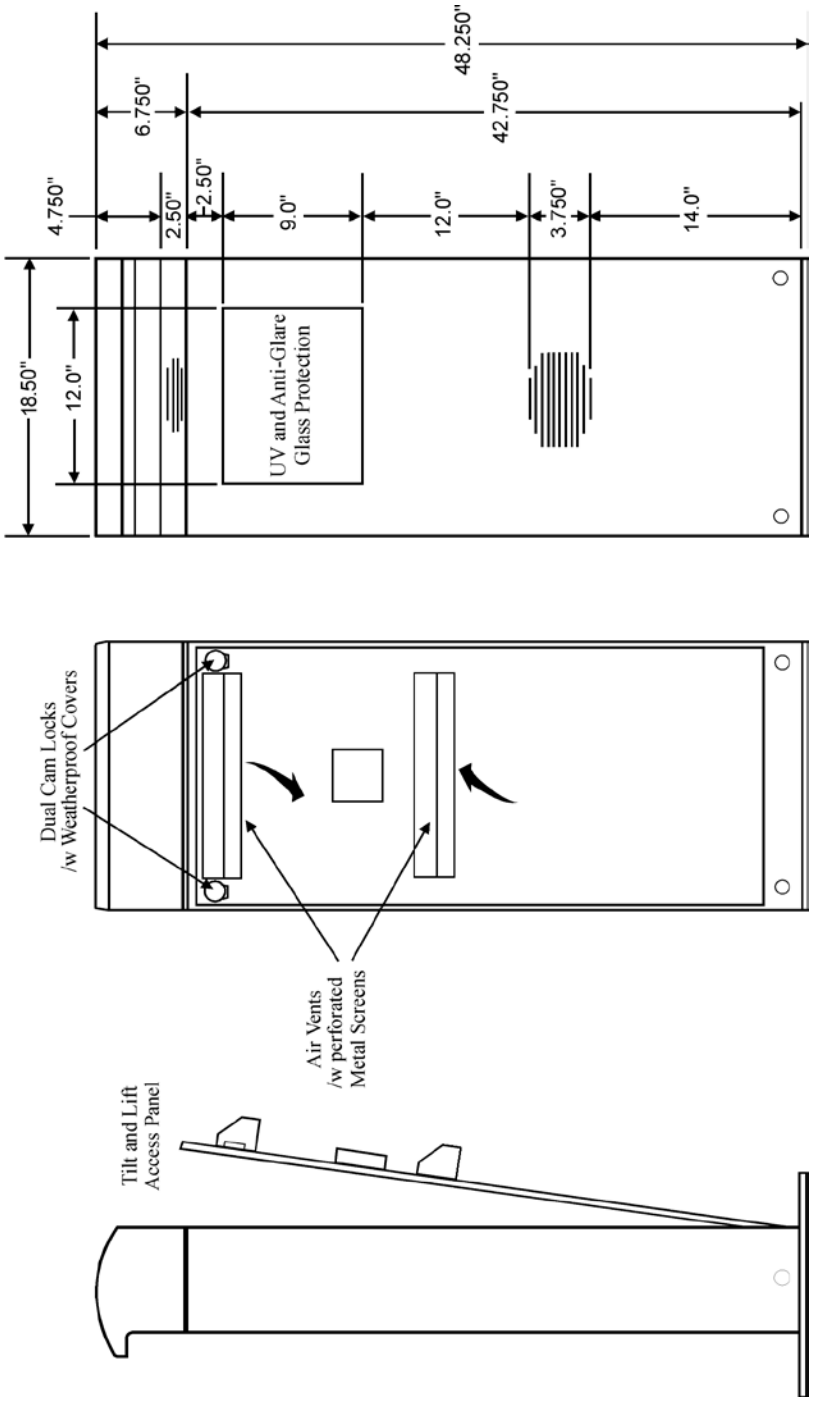


Figure 72 – Order Confirmation System Remote Display Pedestal - Detail 2

Order Confirmation System Remote Display Pedestal Baseplate

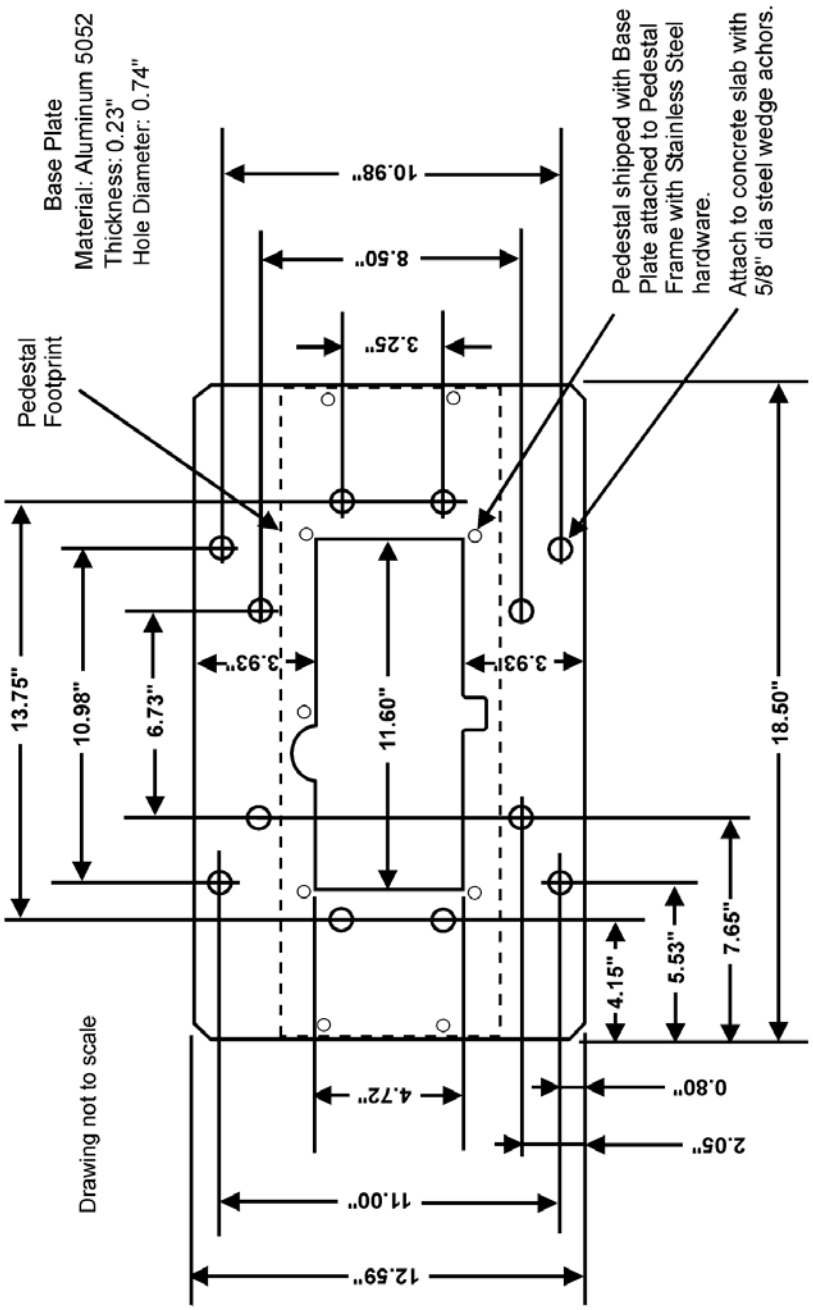


Figure 73 – Order Confirmation System Remote Display Pedestal Baseplate

MICROS 10-Key Bumpbar Mounting Bracket

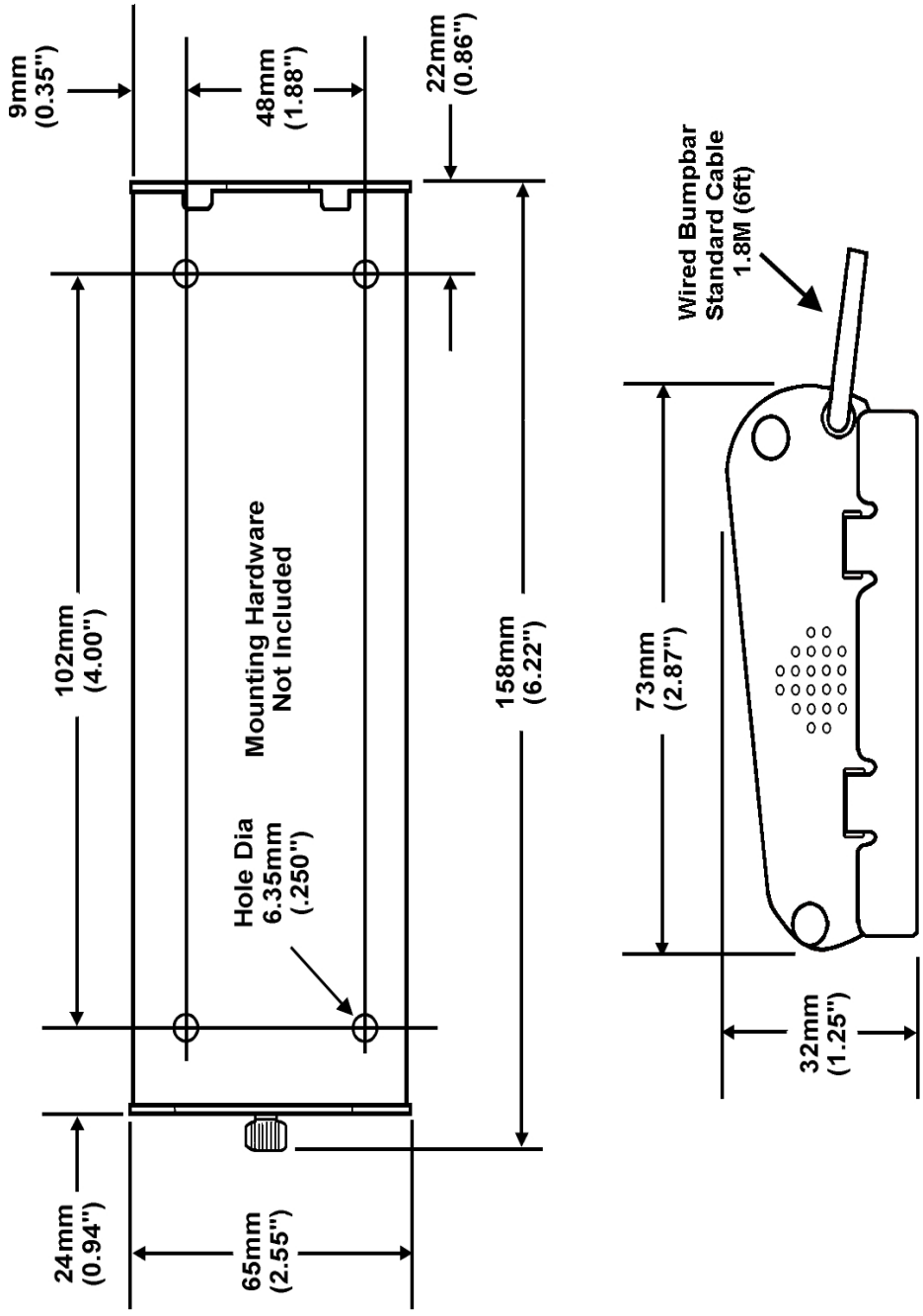


Figure 74 – MICROS 10-Key Bumpbar Mounting Bracket

MICROS 20-Key Bumpbar Mounting Bracket

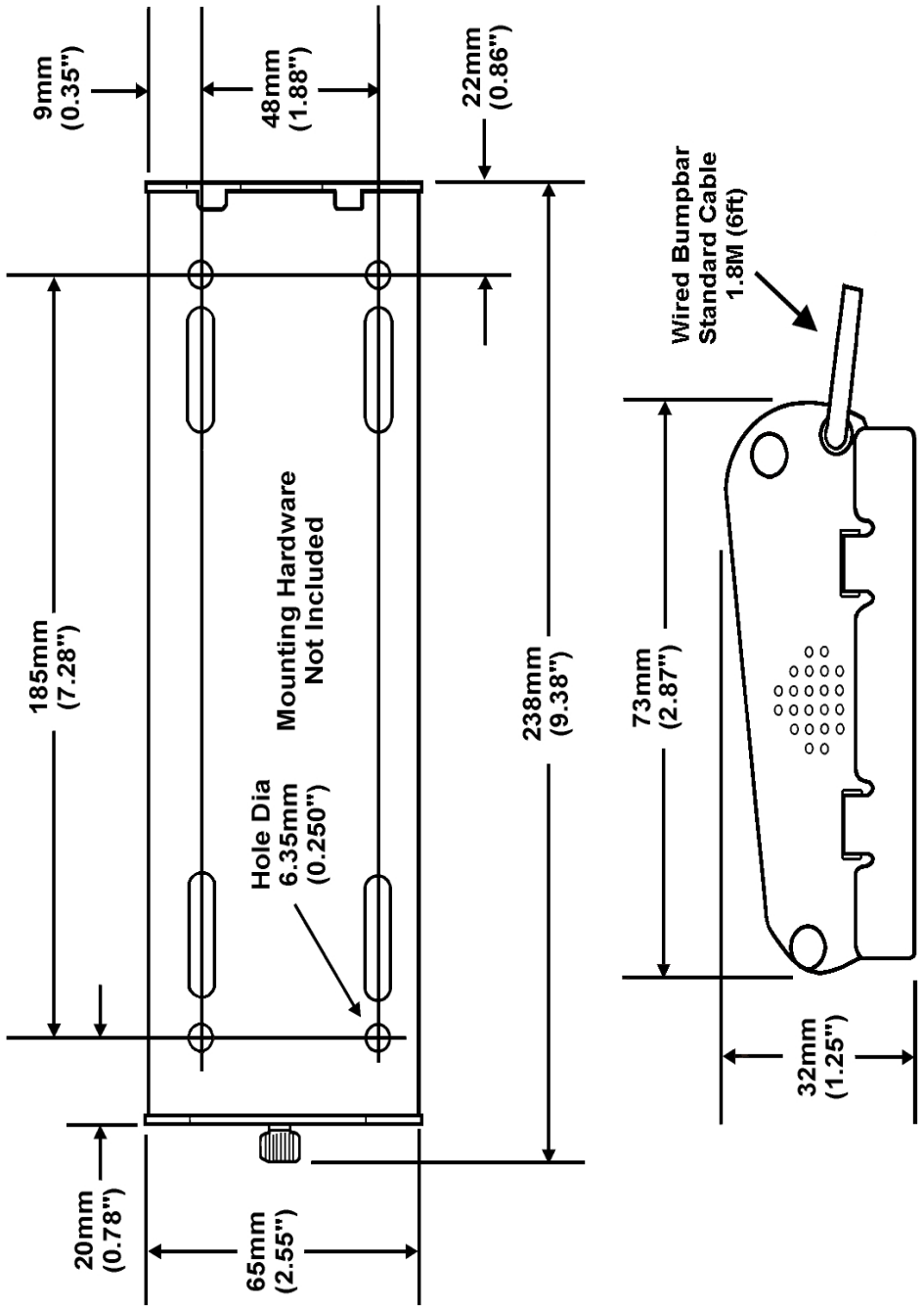


Figure 75 – MICROS 20-Key Bumpbar Mounting Bracket

TM-T88 Thermal Roll Printer

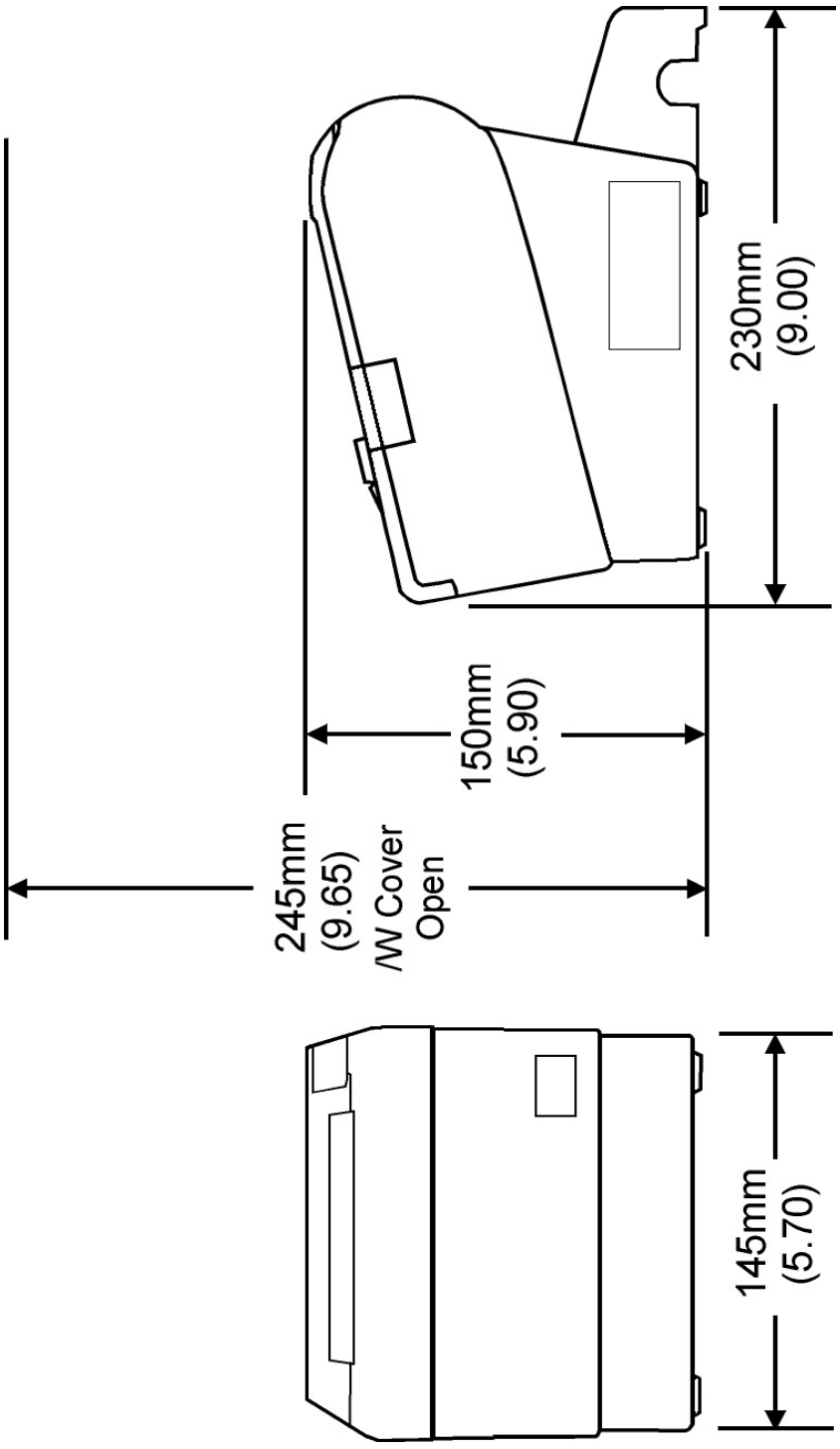


Figure 76 – TM-T88 Thermal Roll Printer

U200D Roll Printer

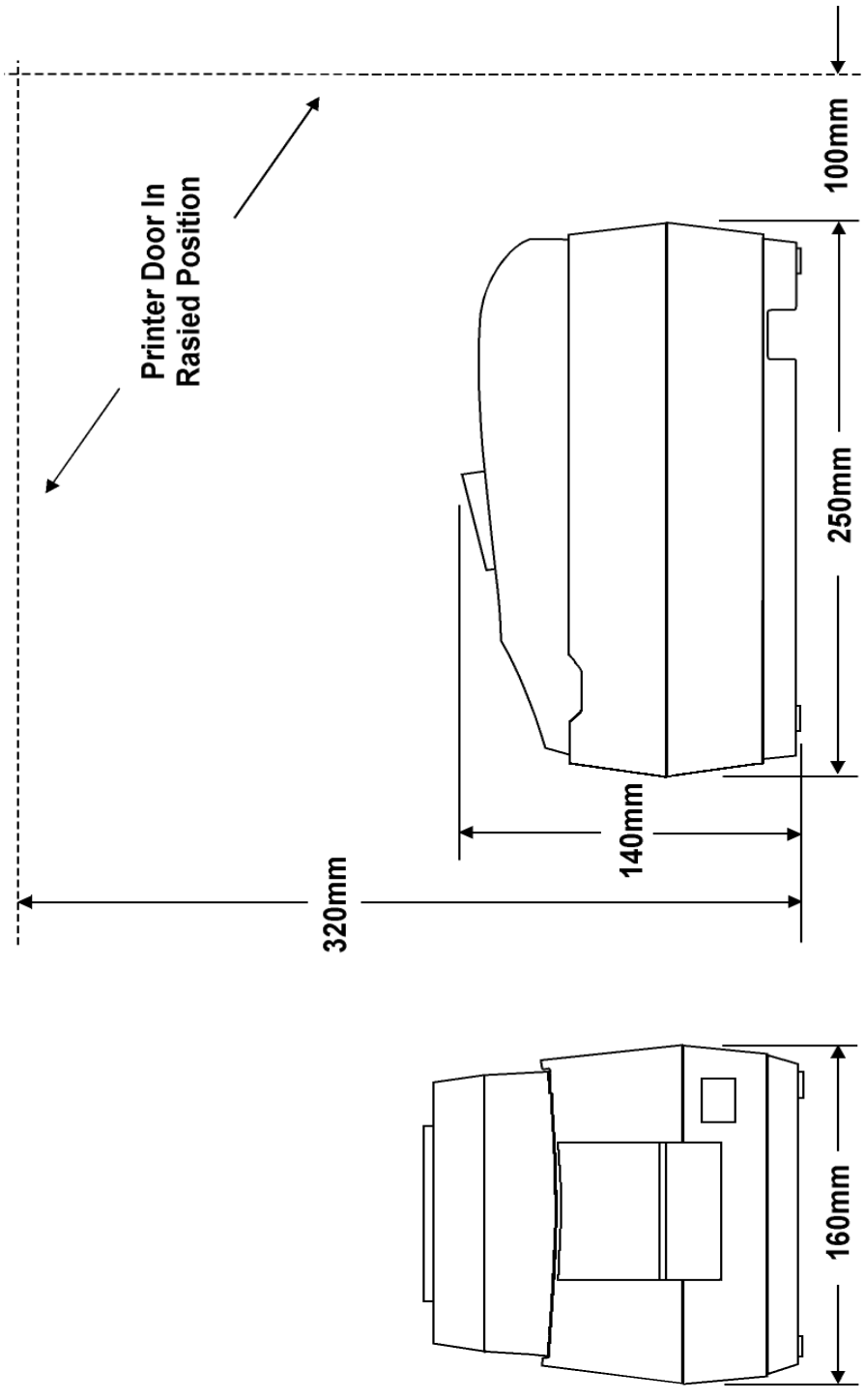


Figure 77 – U200D Roll Printer

U220 AutoCut Roll Printer

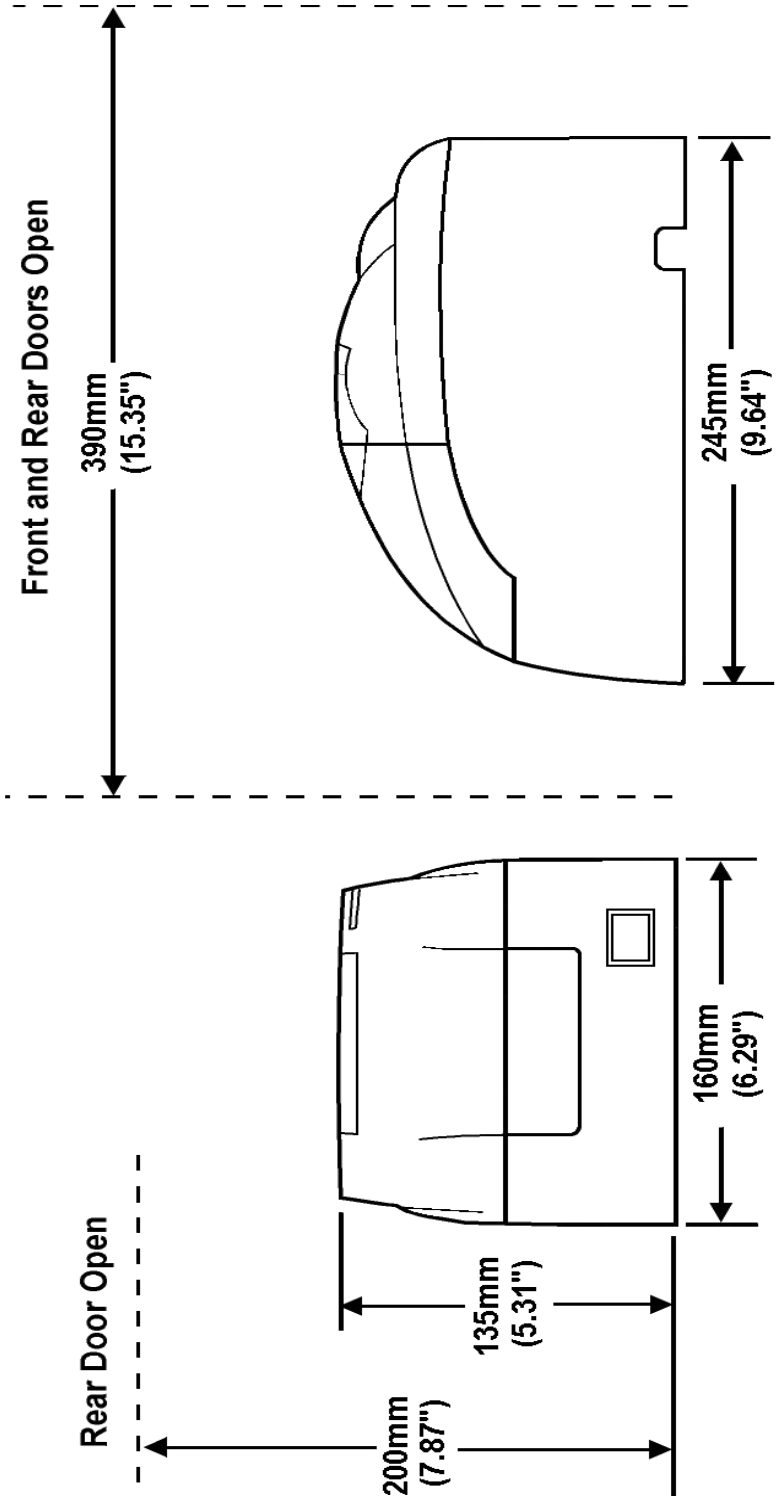


Figure 78 – U220 AutoCut Roll Printer

U200B Autocut Roll Printer

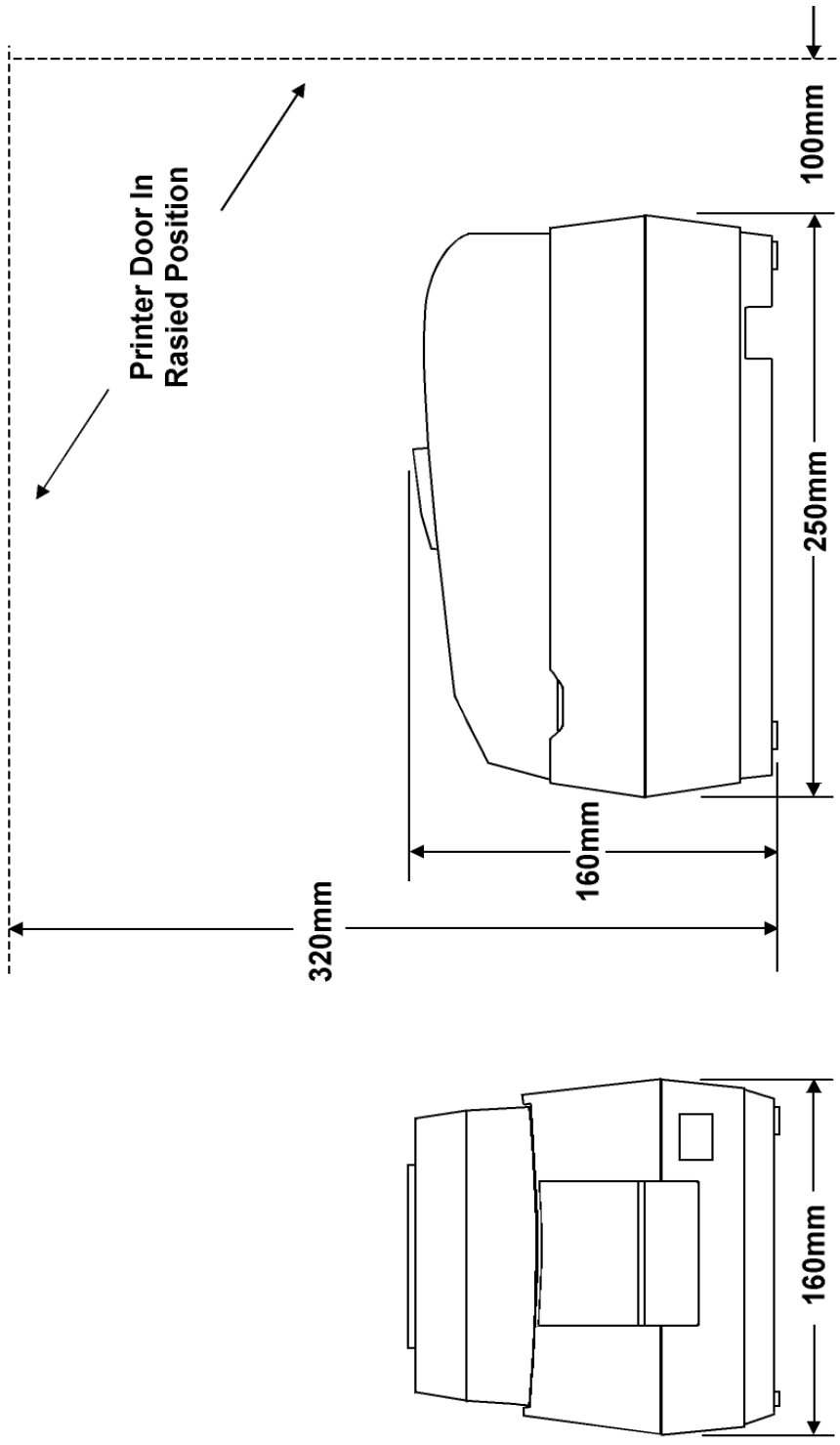


Figure 79 – U220B AutoCut Roll Printer

U230 Autocut Roll Printer

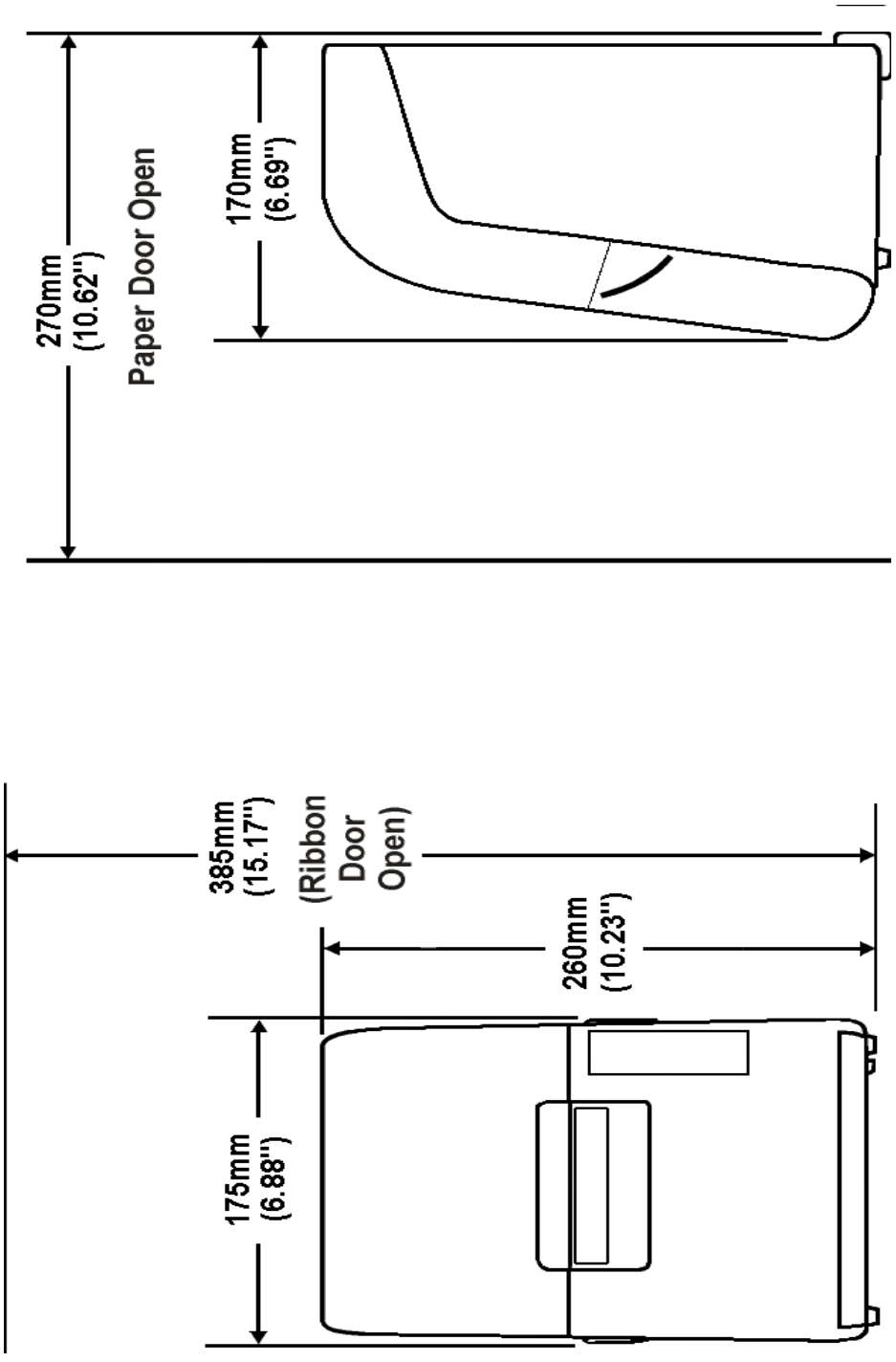


Figure 80 – U230 AutoCut Roll Printer

Pole Mount (6”) Protege Customer Display

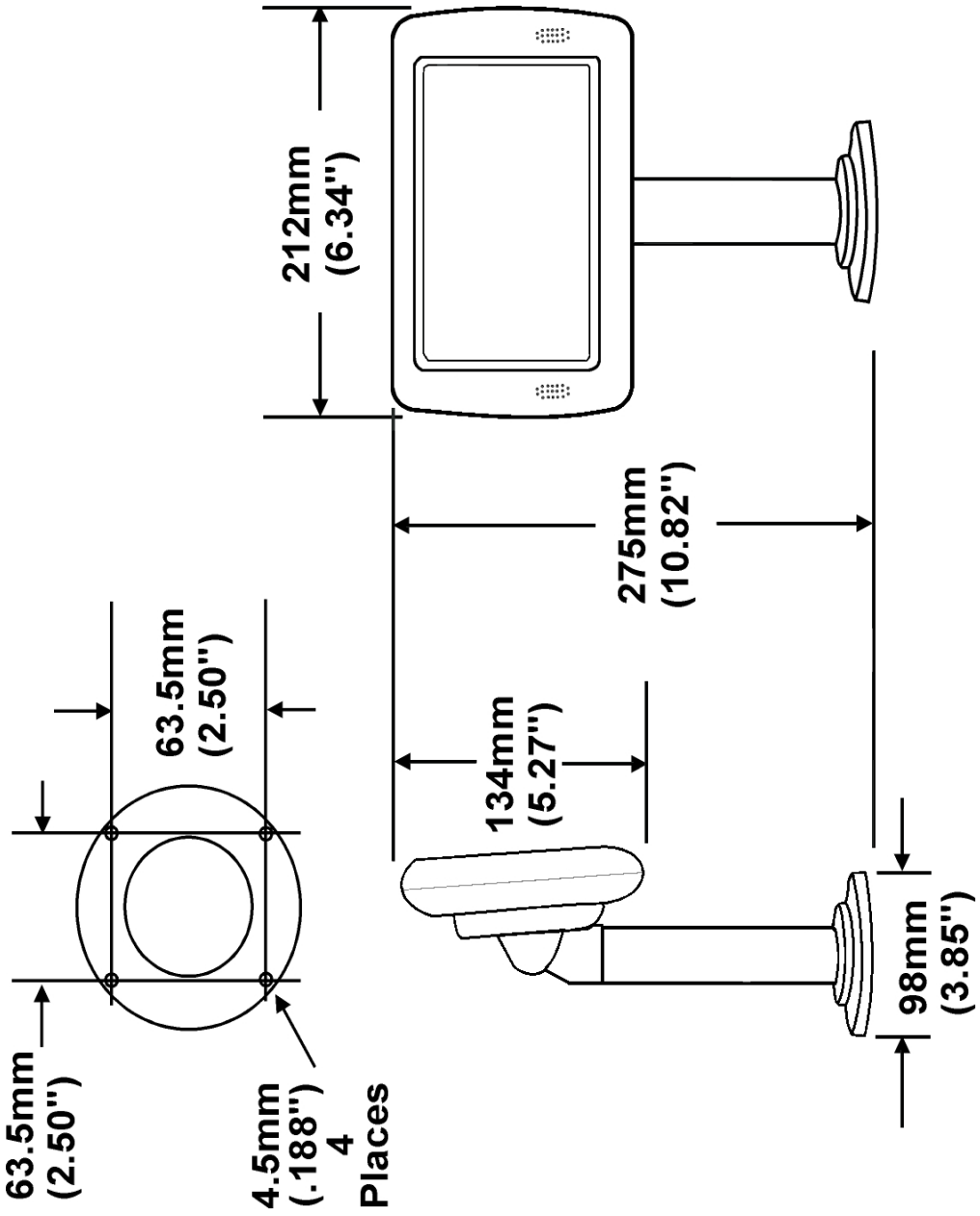


Figure 81 – Pole Mount (6”) Protege Customer Display

Series 1 Pole Customer Display

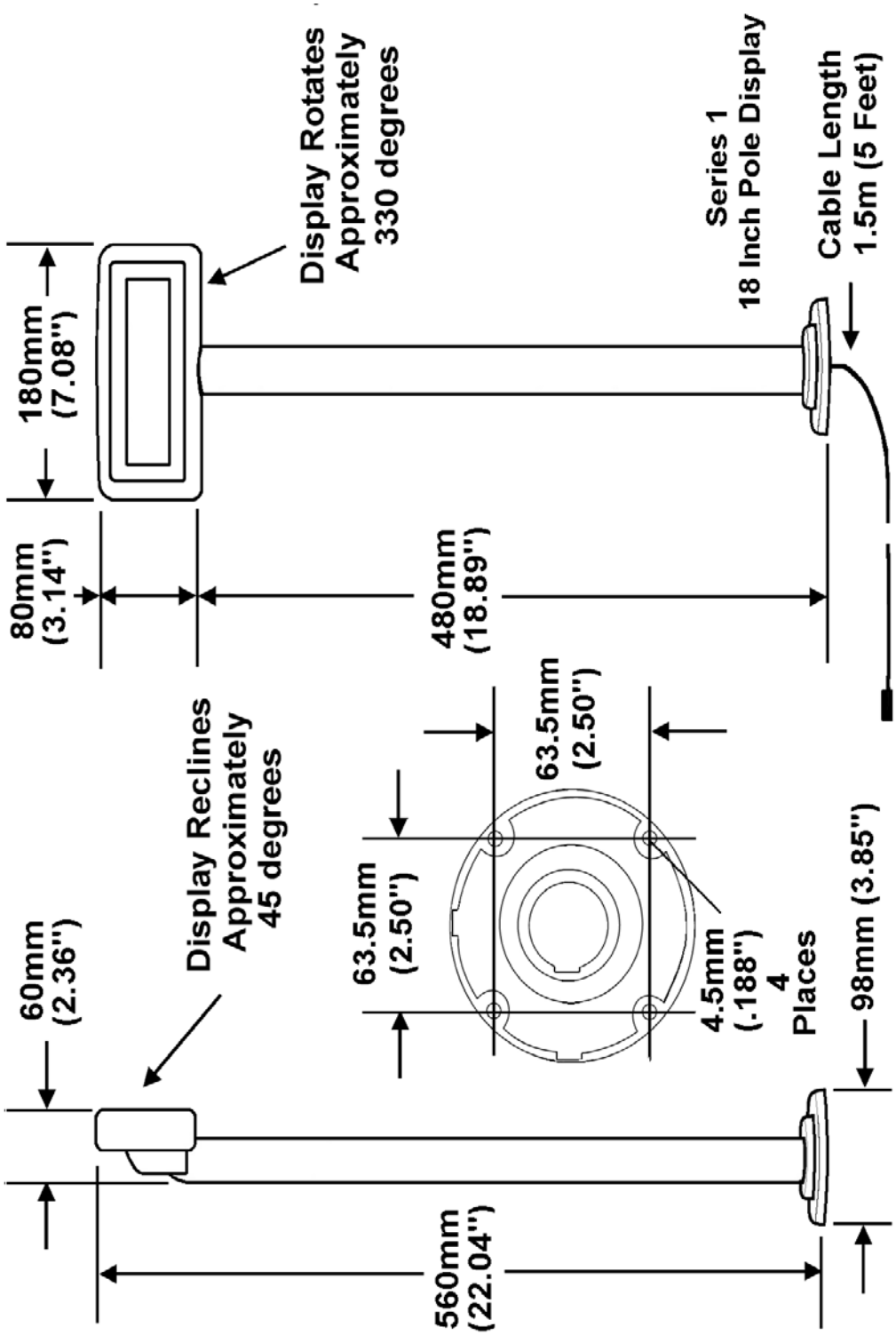


Figure 82 – Series 1 Pole Customer Display

Series 2 Pole Customer Display

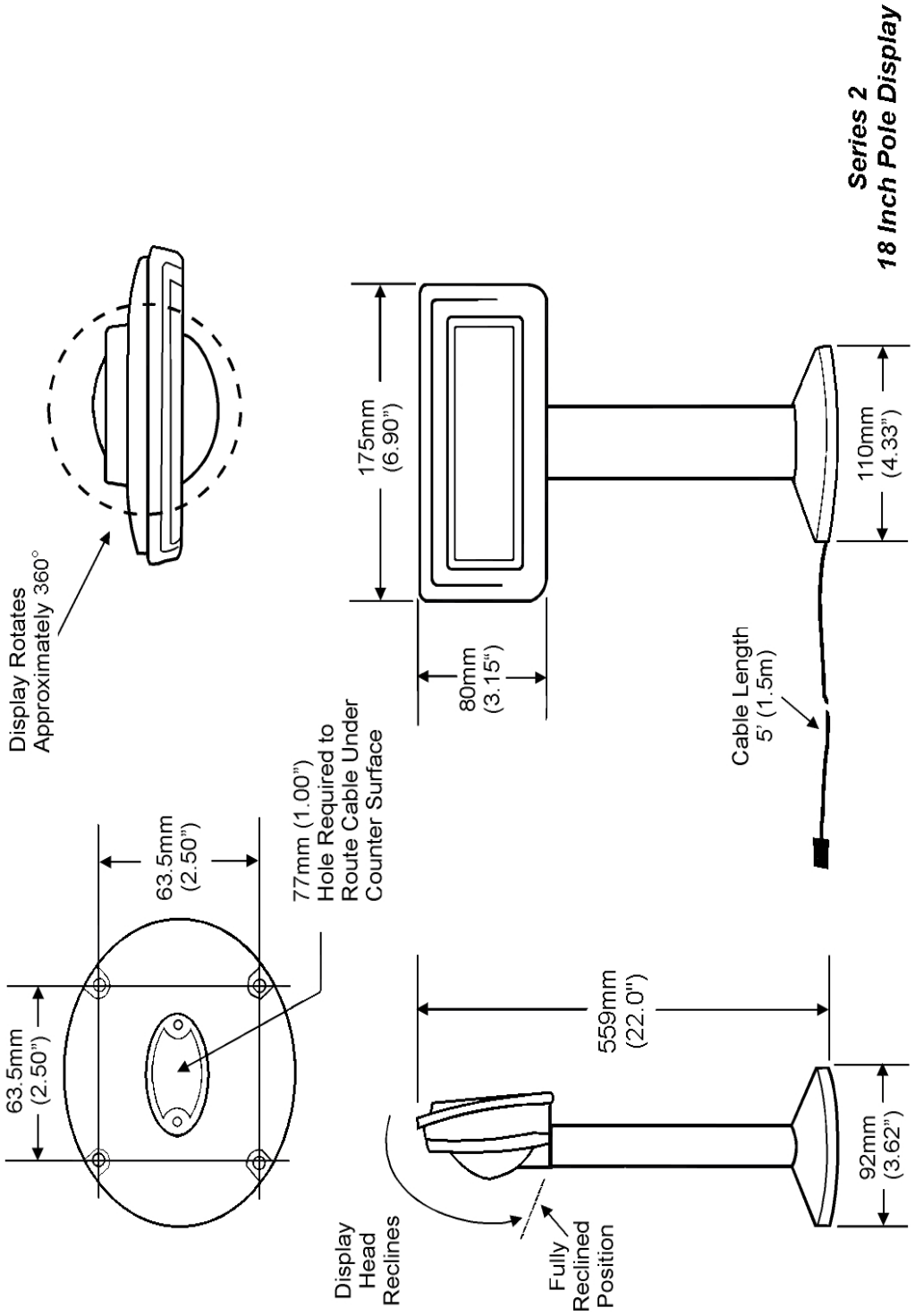


Figure 83 – Series 2 Pole Customer Display

Cash Drawers

MICROS P/N	W	D	H
400018-026	18.0"	16.71"	4.17"
	457.2 mm	424.4 mm	106 mm
400018-027	18.0"	16.71"	4.17"
	457.2 mm	424.4 mm	106 mm
400018-028	18.8"	20.0"	4.17"
	477.5 mm	508mm	106 mm
400018-029	18.8"	20.0"	4.17"
	477.5 mm	508mm	106 mm
400018-033	13.0 "	16.71"	4.17"
	330 mm	424.4 mm	106 mm

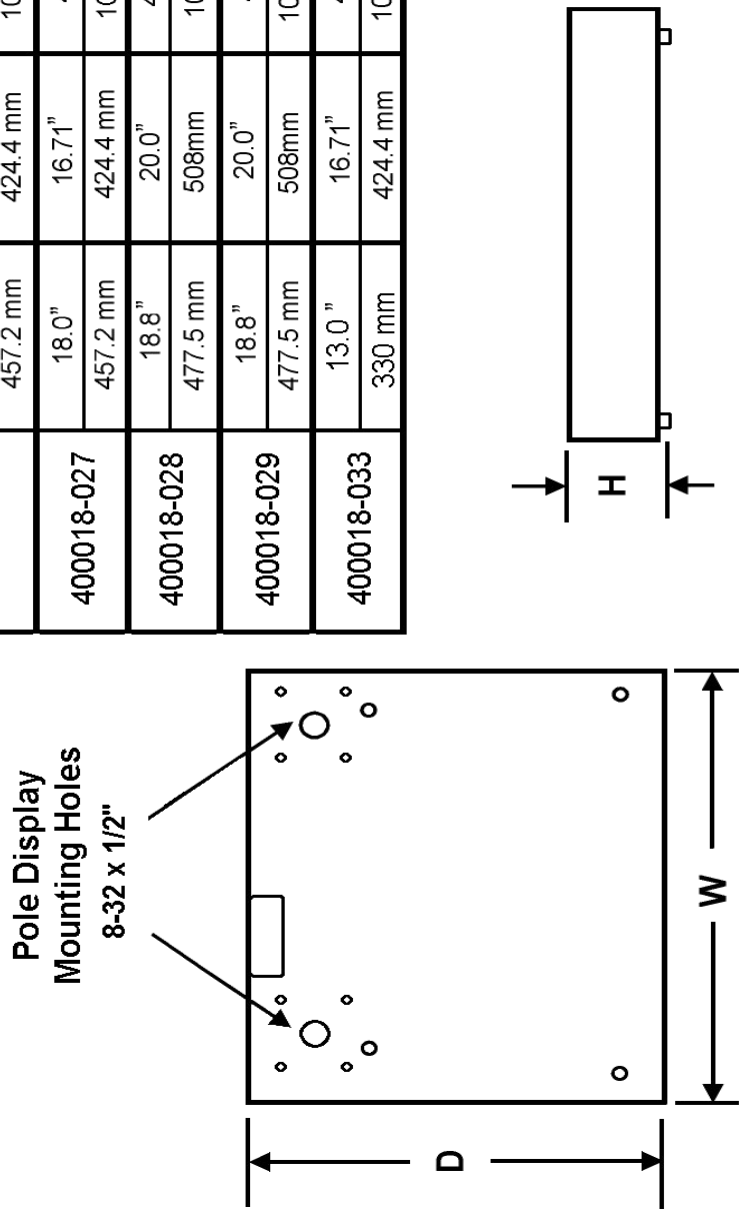


Figure 84 – Cash Drawers

Appendix B: Connector and Cable Diagrams

This appendix provides an overview of the connectors and cables used to hook-up your POS equipment.

Overview

On the pages that follow, you will find diagrams of the connectors and cable assemblies used for connecting peripherals to a Workstation.

To see more information about each Oracle MICROS Workstation, refer to the following Setup Guides:

- PCWS 2010 Setup Guide, PN 100016-144
- Workstation 4 Setup Guide, PN 100016-117
- Workstation 4 LX Setup Guide, PN 100016-162
- Workstation 5 Setup Guide, PN: 100016-165
- Workstation 5A Setup Guide, PN 100016-175
- PC Workstation 2015 Setup Guide, PN 100016-178
- Order Confirmation System Setup Guide, PN 100016-172
- mTablet/mStation Setup Guide

Connectors

The following connectors are located on the IO Panel of the Workstation 4 and 4 LX, Workstation 5 and 5A, PCWS 2010 and 2015 and mStation except where noted.

RS422-A, RS422-B or IDN

Over time two labels have been used to denote this multifunction Serial Port.

Workstations such as the WS 4 and 4 LX, KWS 4 and KW270 include two ports labeled RS422-A and RS422-B. Later workstations including the WS5, 5A, PCWS 2010, PCWS 2015 and mStation include a single RS422 port labeled 'IDN'.

The IDN (COM4) and RS422-A/RS422-B (COM4 and COM5) ports are functionally equivalent, and default to RS422 mode in order to drive MICROS IDN printers. Figure 1 shows the pin-out of the RS422 configuration. The POS application can convert this port to a simple two- wire RS232 interface for driving serial peripherals.

Port Configured for driving RS422 IDN Devices - IDN(+)

The figure below shows the pin configuration of this port when driving IDN devices.

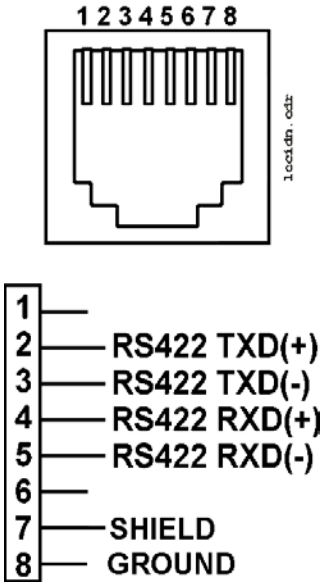


Figure 85 – IDN or RS422-A/B Connectors Configured for IDN Printing

Port Configured for RS232 Devices

The figure below displays the multifunction modular port(s) configured as a basic RS232 Interface.

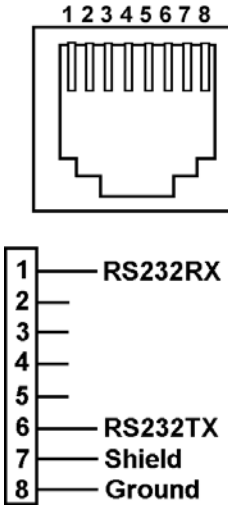


Figure 86 – IDN or RS422-A/B Connectors Configured for RS232

Modular RS232 COM Port Diagram

Figure 3 displays a pin-out of the full featured RJ45 port available on the PCWS 2010 and 2015, (COM5), Workstation 5 (COM5) Workstation 5A (COM2 and COM5), KW270 (COM2) and mStation (COM5).

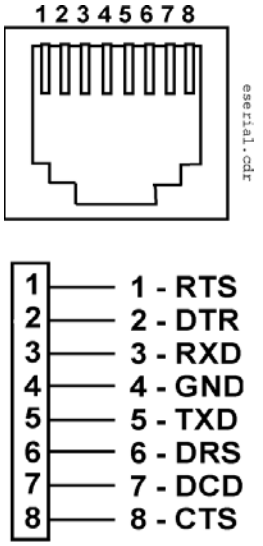


Figure 87 – Modular COM Port with Handshaking

RS232 DB9 Connector

One DB9 RS232 connector, configured as COM1, is present on all current and legacy MICROS Workstations. The PCWS 2010, 2015, and mStation add a second DB9 Serial Port.

The PCWS 2015 and mStation add power to the DB9 COM Ports. In the PCWS 2015, the DB9 COM port voltage is selected in the BIOS.

For the mStation, the DB9 COM port voltage is selected in the mTablet/ mStation Diagnostics Utility.

Refer to the appropriate workstation setup guide for more detail about powered DB9 COM ports.

The figure below displays the non-powered connector pin outs on the left and the powered connector pin outs on the right. The selected voltage, DSUB PWR, appears on Pin-9, the Ring Indicator.

The selected voltage is applied to Pin 9, the Ring Indicator signal.

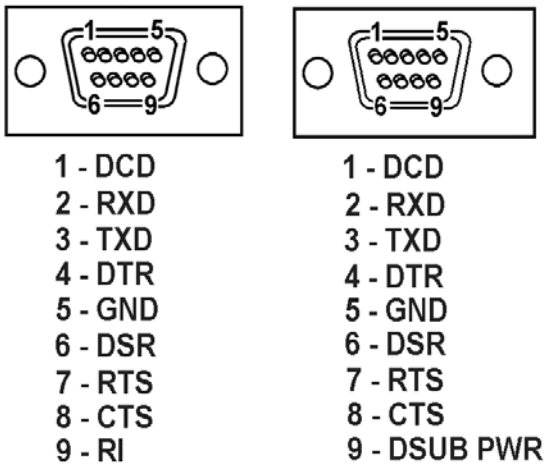


Figure 88 – RS232 DB9 Connector

Cash Drawer 1 and 2 Connectors

All MICROS Workstations up to mStation contain a pair of the connectors shown in the figure below.

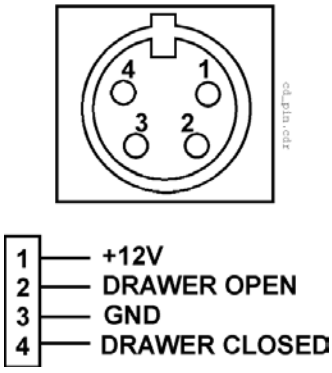


Figure 89 – MICROS 4-Pin DIN Cash Drawer Connectors

The mStation introduces a pair of new Cash Drawer connectors based on the 8-pin Mini-DIN connector shown in the figure below.

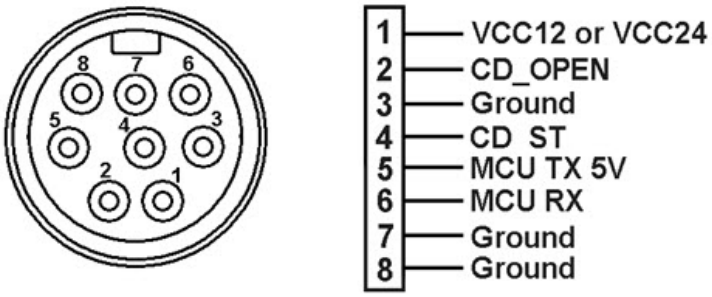


Figure 90 – MICROS 8-Pin Mini-DIN Cash Drawer Connector

Pole Display Connector

The Pole Customer Display port is located on virtually all Workstations including the WS4, WS4 LX, KWS4, KW270, WS5, WS5A, PCWS 2010, 2015, and mStation.

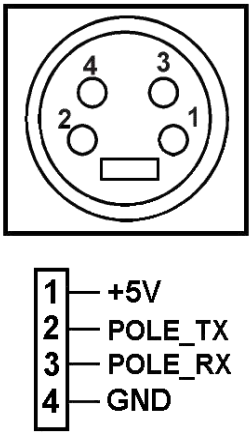


Figure 91 – Remote Customer Display Connector Diagram

Hook-Up Cables

The following pages include assorted diagrams of optional hook-up cables that may be used on most MICROS Workstations.

Null Modem Cable for e7 KVM Controller

The figure below displays a Null Modem Cable that can be used for the e7 KVM Controller serial interface.

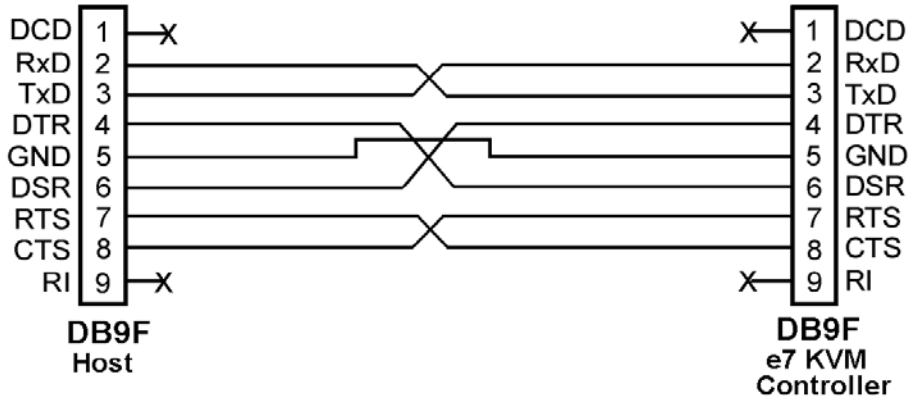


Figure 92 – Null Modem Cable Pin-Outs

IDN Port Conversion Cables

The figure below displays a diagram of adapter cable PN 300319-102. This cable converts the RJ45 IDN or RS422-A/RS422-B ports shown in Figure 2 to a DB9 Male connector.

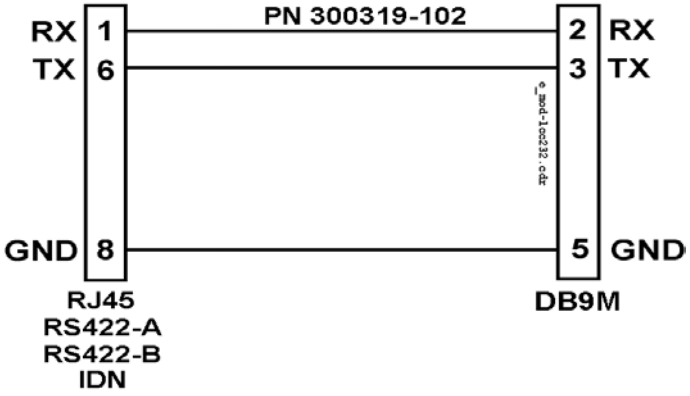


Figure 93 – Modular LCC/RS232 to DB9 Male Connector

The figure below displays a diagram of a similar cable that terminates with a DB25 Male connector in place of the DB9.

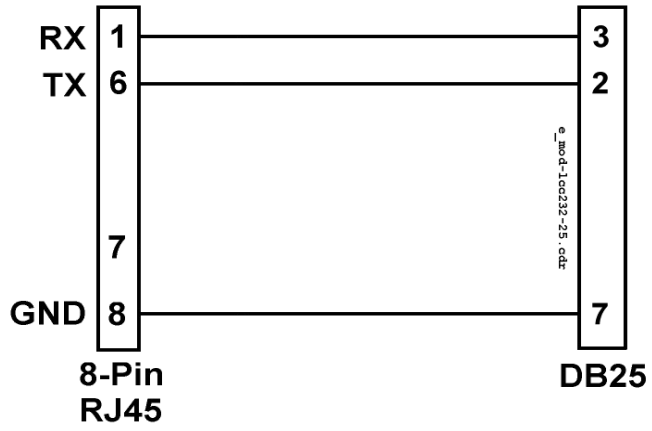


Figure 94 – Modular LCC/RS232 to DB25 Connector

Modular RS232 Port to DB9/DB25 Male Connector

The figure below displays a diagram of cable PN 300319-103. This cable converts a modular COM 2 or COM 5 port to a DB9 Male connector.

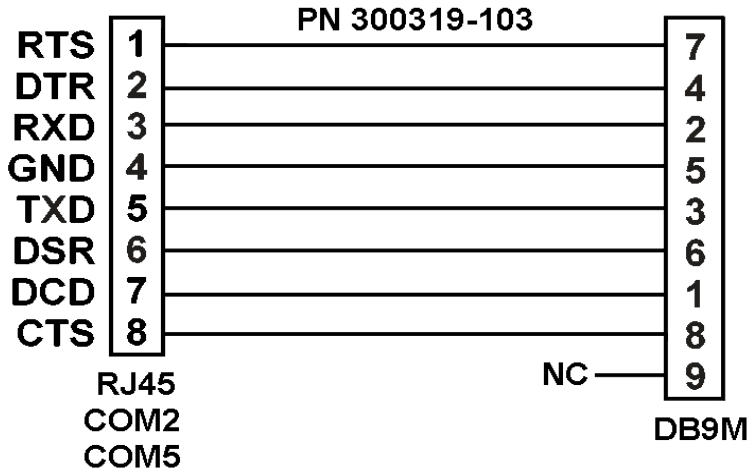


Figure 95 – Modular RS232 Port to DB9 Male Connector

The figure below displays a diagram of a similar cable that terminates in a DB25 Male connector.

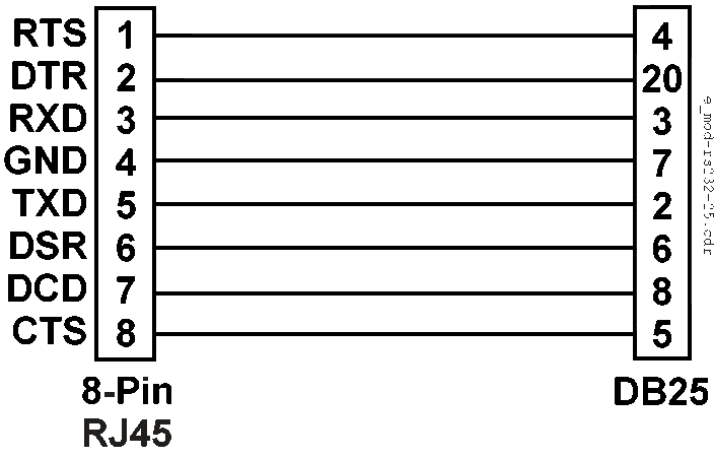


Figure 96 – Modular RS232 Port to DB25 Male Connector

8-Pin to 6-Pin Hook-up RS422 Cable (3ft. 300319-036, 10ft. 300319-120)

The figure below shows a diagram of the patch cable connected between a workstation IDN or RS422-A/RS422-B port to a printer IDN port or 6-pin modular jack on a wall plate.

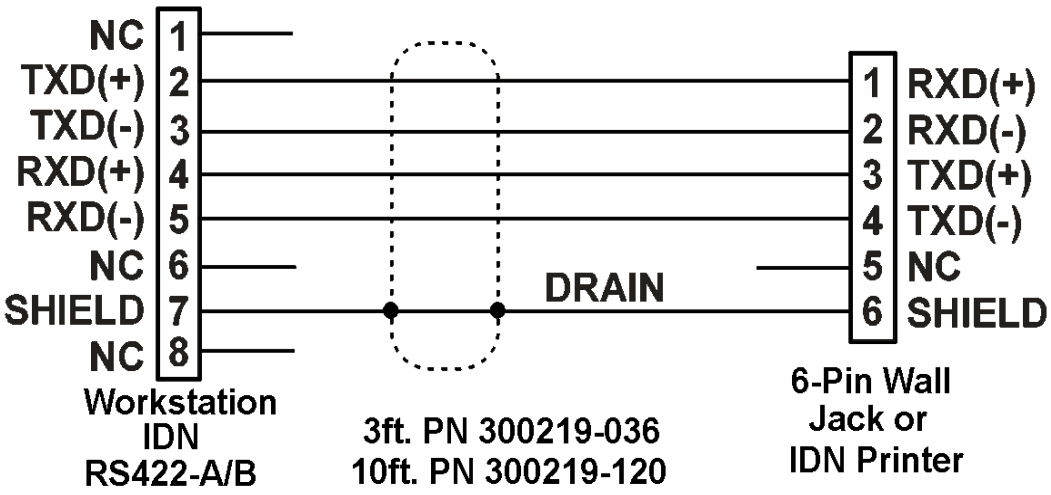


Figure 97 – Workstation to Printer IDN Hook-up Cable Diagram

IDN to EIA/TIA-568-A Patch Cable (300319-303)

The figure below displays a diagram of the patch cable used to build an IDN network using STP Category 5 or better cabling. See Chapter 4.

Figure 98 – IDN to EIA/TIA-568-A Conversion Cable Diagram

Appendix C: FCC/DOC Statement

Federal Communications Commission Radio Frequency Interference Statement

This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in equipment, in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

If this equipment appears to cause interference the user could consult the installer/dealer or an experienced radio television technician.

A booklet prepared by the Federal Communications Commission entitled "How to Identify and Resolve Radio - TV Interference Problems" may be useful. This booklet may be ordered from the Superintendent of Documents, U.S. Government Printing Office, Washington D.C. with stock number #004-000-00345-4.

CAUTION: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. Shielded interface cables must be used in order to comply with the emission limits.

Canadian Department of Communications Statement

This digital apparatus does not exceed the Class A/Class B (whichever applies) limits for radio noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'êmet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Classe A/de Classe B (selon le cas) prescrites dans Le Règlement sur le Brouillage Radioélectrique Idicté par le Ministère des Communications du Canada.

ATTENTION: Tous changement ou modification, non expressément agrées par la partie responsable pour la conformité de l'installation, pourraient annuler l'authorisation de l'exploitation par l'utilisateur du materiel installé. Il est obligatoire d'utiliser pour la communication ou la réalisation d'intorfaces un cable blindé, afin d'être en conformité avec les limites légales d'émission.